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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/809,329	03/16/2001	Marie Christine Bissery	03806.0493	5359
22852	7590	08/26/2003		
FINNEGAN, HENDERSON, FARABOW, GARRETT & DUNNER LLP 1300 I STREET, NW WASHINGTON, DC 20005			EXAMINER	
			HENRY, MICHAEL C	
			ART UNIT	PAPER NUMBER
			1623	

DATE MAILED: 08/26/2003

(B)

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/809,329	BISSERY, MARIE CHRISTINE	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on _____.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-20 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
 If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All
 - b) Some *
 - c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
 - a) The translation of the foreign language provisional application has been received.
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s). _____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-7, 9-12 are rejected under 35 U.S.C. 102(b) as being anticipated by Furuta et al. (Jpn J Cancer Chemother 18 (3): 393-402, 1991).

In claim 1, applicants claim “a synergistic therapeutic pharmaceutical composition for solid tumors comprising an effective amount of camptothecin, or a camptothecin derivative, in combination with an effective amount of a topoisomerase II inhibitor, wherein said composition provides a synergistic effect in the treatment of solid tumors.”

Furuta et al. disclose applicant's claimed, therapeutic pharmaceutical composition, comprising an effective amount of camptothecin derivative (CPT-II), in combination with an effective amount of a topoisomerase II inhibitor (adriamycin or doxorubicin), wherein said composition provides a synergistic effect in the treatment of tumors (see summary or abstract and tables). The applicant's composition of claims 2-7, 9-12 is also anticipated by Furuta et al. (see summary or abstract and tables). It should be noted that claims 1-7, 9-11 are composition claims and the recitation of the intended utility of the composition is not a further limitation of the claim. The examiner gives very little weight to said intended utility.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5,8,13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuta et al.

In claims 5 and 7, applicant claims a composition as in claim 3 and 6 respectively, wherein said antibiotic is daunomycin (claim 5) and wherein said epipodophyllotoxin is teniposide (claim 7).

Furuta et al. disclose a composition as in claim 3 and 6 respectively, wherein said antibiotic is adriamycin and wherein said epipodophyllotoxin is etoposide.

The difference between applicant's claimed method and the method taught by Furuta et al. is that the applicant's antibiotic is daunomycin as compared to adriamycin and applicant's epipdophyllotoxin is teniposide as compared to etoposide. However, daunomycin and adriamycin are both well known anthracycline antibiotics or antitumor agents of very similar structure. That is, they can be considered species of the same genus. Also, the epipdophyllotoxin, teniposide and etoposide are antitumor agents that can also be considered species of the same genus.

It would have been obvious to one having ordinary skill in the art, at the time the claimed invention was made, in view of Furuta et al., to prepare and administer a therapeutic pharmaceutical composition, comprising an effective amount of camptothecin, or a camptothecin

derivative, in combination with an effective amount of a topoisomerase II inhibitor like daunomycin (which can be considered to belong to the same genus as adriamycin (doxorubicin), for the treatment of different tumors.

One having ordinary skill in the art would have been motivated in view of Furuta et al., to prepare and administer a therapeutic pharmaceutical composition, comprising an effective amount of camptothecin, or a camptothecin derivative, in combination with an effective amount of a topoisomerase II inhibitor like daunomycin based on need, like the type and/or degree of severity of the tumor.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 13-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuta et al.

In claim 13, applicant claims a method of treating a solid tumor, comprising administering an effective amount of camptothecin, or a camptothecin derivative, as a first agent, in combination with an effective amount of a topoisomerase II inhibitor as a second agent, wherein the agents are administered simultaneously, semi-simultaneously, or separately, and wherein said first and second agents provide a synergistic effect in the treatment of said solid tumor.

Furuta et al. disclose a method of treating a tumor (L 1210 leukemia), comprising administering an effective amount of a camptothecin derivative, as a first agent, in combination

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with administration of an effective amount of a topoisomerase II inhibitor as a second agent, wherein the agents are administered simultaneously, semi-simultaneously, or separately and wherein said first and second agents provide a synergistic effect (see abstract and tables).

The difference between applicant's claimed method and the method taught by Furuta et al. is that the applicant's type of tumor that is treated.

It would have been obvious to one having ordinary skill in the art, at the time the claimed invention was made, in view of Furuta et al., to use the method of Furuta et al. to treat various types of tumors like solid tumors, and to use antitumor agents taught by Furuta et al. that belong to the same genus as (adriamycin and daunomycin) and (teniposide and etoposide) for the treatment of different tumors, based on need, like the type and/or degree of severity of the tumor.

One having ordinary skill in the art would have been motivated in view of Furuta et al., to use the method of Furuta et al. to treat various types of tumors like solid tumors, and to use antitumor agents taught by Furuta et al. that belong to the same genus as (adriamycin and daunomycin) and (teniposide and etoposide), for the treatment of different tumors, based on need, like the type and/or degree of severity of the tumor.

It should be noted that claims 14-20 are also obvious in view of Furuta et al., and that the oral administration of the composition as recited in claim 20 is also based on need, like the type and/or degree of severity of the tumor and the subject that is treated.

Response to Amendment

Applicant's arguments filed August 4, 2003 have been fully considered but they are not persuasive.

The applicant argues that applicant has overcome the heavy presumption that the term "synergy" should be given its ordinary and customary meaning, because applicant has acted as her own lexicographer. Applicant also acknowledges that

First, the claim term will not receive its ordinary meaning if patentee acted as his own lexicographer and clearly set forth a definition of the disputed claim term in either the specification or prosecution history. Second, a claim term will not carry its ordinary meaning if the intrinsic evidence show that the patentee distinguished that term from prior art.

However, applicant has not clearly set forth a definition of the disputed claim term, synergy(or synergistic or synergism). Particularly, applicant set forth a definition for "therapeutic synergy" by stating in the specification that a combination manifests therapeutic synergy if it is therapeutically superior to one or other of the constituents used at its optimum dose (T.H. Corbett et al., *Cancer Treatment Reports*, 66:1187 (1982)). Furthermore, in the claims applicant claims a synergistic therapeutic pharmaceutical composition, but therapeutic synergy as defined by applicant is not identical to the synergistic therapeutic pharmaceutical composition claimed by applicant. Synergistic therapeutic pharmaceutical composition, implies a therapeutic pharmaceutical composition that exhibits synergy (or a synergistic effect) in general, regardless of whether the synergy is therapeutic synergy as defined by applicant. Also, the applicant has not set forth a definition for the claimed term synergistic therapeutic pharmaceutical composition which is not identical to therapeutic synergy and thus applicant has not distinguished said term from the prior art. Consequently, by claiming a synergistic therapeutic pharmaceutical composition, applicant has claimed Furuta's therapeutic pharmaceutical composition which is synergistic. It should also be noted that not all of the claims use the word therapeutic with synergistic or synergy (see claim 13 which recites ... a synergistic effect ...).

Moreover, the specification defines the term “therapeutic synergy” whereas the applicant claims synergy in general, (as in synergistic therapeutic pharmaceutical composition (claims 1,2 and 11) and synergistic effect (claim 13)), and thus does not define the term, synergy (or synergistic) with reasonable clarity, deliberateness, and precision necessary for departure from ordinary meaning. For example, in Abbott Laboratories v. Syntron Bioresearch Inc., 67 USPQ2d 1337 (CA FC 2003), the

“Term “analyte,” as used in claims of patent for chemical analysis apparatus and method, should be given plain meaning adopted by federal district court, namely, “the substance that the test is designed to detect if present in the liquid being tested,” even though patentee defined “analyte” in specification, since specification provides two alternative definitions for term, and thus does not define term with reasonable clarity, deliberateness, and precision necessary for departure from ordinary meaning.” See Abbott Laboratories v. Syntron Bioresearch Inc., 67 USPQ2d 1337 (CA FC 2003).

Consequently, because applicant fails to define the term with reasonable clarity, deliberateness, and precision necessary for departure from ordinary meaning, the definition of synergism (or synergistic effects or synergy) is not limited to the applicant’s condition or term that he/she refers to as optimum dose (i.e., highest non-toxic dose). Some ordinary meaning or definitions includes a definition from Webster’s New World Dictionary (3rd college edition, 1988, page 1358) which defines synergism as “the simultaneous action of separate agencies which, together, have greater total effect than the sum of their individual effects; said esp. of drugs . . .” Yet another definition states that “it is not uncommon for the effect of two chemicals on an organism to be greater than the effect of each chemical individually, or the sum of the individual effects. The presence of one chemical enhances the effects of the second. This is called a synergistic effect or synergy, and the chemicals are sometimes described as showing

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synergism." (see, http://physchem.ox.ac.uk/MSDS/glossary/synergistic_effect.html, The Physical and Theoretical Chemistry Laboratory, Oxford University, England Chemical Safety Information - Glossary). Thus, synergism is not limited to an optimum dose (i.e., highest non-toxic dose) and therefore, Furuta et al. do not have to disclose an optimum dose (i.e., highest non-toxic dose) in reporting synergism or synergistic effects of their composition. Also, Furuta et al. data of Table 3 shows that the effect (survival times) of two chemicals (CPT-II and adriamycin) on the inoculated mice (an organism) is greater than the effect of each of these chemicals individually (for example, 12.5 mg/kg of CPT-II + 6.25 mg/kg of adriamycin produces a survival time of 16.5 ± 1.7 days whereas, 12.5 mg/kg of CPT-II produces a survival time of 10.8 ± 0.4 days and 6.25 mg/kg of adriamycin produces a survival time of 11.7 ± 0.7 days; based on three administrations (days 1,5,9) per dosing regimen). This result complies with the latter stated definition of synergism or synergistic effect and also with applicant's definition excluding the limitation or term, "when used at maximum dose". Moreover, applicant's synergistic therapeutic pharmaceutical composition, as claimed reads on Furuta et al.' synergistic therapeutic pharmaceutical composition.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael C. Henry whose telephone number is 703 308-7307. The examiner can normally be reached on 8:30 am to 5:00 pm; Mon-Fri. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James O. Wilson can be reached on 703 308-4624. The fax phone number for the organization where this application or proceeding is assigned is 703 308-4556.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703 308-1235.

MCH

August 19, 2003.



SAMUEL BARTS
PRIMARY EXAMINER
GROUP 1600

FULL TEXT OF CASES (USPQ2D)

Cases Publishing the Week of Aug 04, 2003

Abbott Laboratories v. Syntron Bioresearch Inc., 67 USPQ2d 1337 (CA FC 2003)

Abbott Laboratories v. Syntron Bioresearch Inc., 67 USPQ2d 1337 (CA FC 2003)

67 USPQ2D 1337**Abbott Laboratories v. Syntron Bioresearch Inc.
U.S. Court of Appeals Federal Circuit**

Nos. 02-1203, -1257

Decided July 10, 2003

Headnotes**PATENTS****[1] Patent construction — Claims — Broad or narrow (§125.1303)****Patent construction — Claims — Defining terms (§125.1305)**

Claims of patent for chemical analysis apparatus and method that require reactant to be either “non-diffusively bound” or “non-diffusively immobilized” do not require reactant to be present in amount sufficient to allow quantitative assays, since pertinent dictionary definitions do not support quantitative analysis requirement, and plain meaning of claim recitation therefore does not support such narrowing construction, and since usage of disputed claim terms in context of claims as whole suggests that quantitative analysis should not be read as requirement of quoted recitations.

[2] Infringement — Construction of claims (§120.03)**Patent construction — Claims — Defining terms (§125.1305)**

Judgment of noninfringement is affirmed as to asserted claims of patent for chemical analysis apparatus and method that require use of reactant “specific for” particular analyte or reaction product, since agreed-upon claim construction required reactant to be capable of preferentially reacting or binding with analyte from among thousands of molecules potentially in test sample, since it is undisputed that reactant employed in accused devices binds identically with analyte and another substance, and since jury therefore could have reasonably concluded that such reactant did not meet claim recitation as construed by federal district court in jury instructions.

[3] Infringement — Construction of claims (§120.03)**Patent construction — Claims — Defining terms (§125.1305)**

Judgment of noninfringement is affirmed as to asserted claims of patent for chemical analysis apparatus and method that require use of “predetermined amount” of reactant in reaction zone, since unchallenged claim construction provided in jury instructions required accused devices to include “an amount determined beforehand,” since record shows that defendant’s manufacturing process merely involves placing reactant solution on test strip and “eyeballing” it to make sure reactant is present, and since reasonable jury therefore could conclude that amount of reactant on accused devices was not “determined beforehand.”

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[4] Patent construction — Claims — Broad or narrow (§125.1303)

Patent construction — Claims — Defining terms (§125.1305)

Term “analyte,” as used in claims of patent for chemical analysis apparatus and method, should be given plain meaning adopted by federal district court, namely, “the substance that the test is designed to detect if present in the liquid being tested,” even though patentee defined “analyte” in specification, since specification provides two alternative definitions for term, and thus does not define term with reasonable clarity, deliberateness, and precision necessary for departure from ordinary meaning.

[5] Patentability/Validity — Specification — Written description (§115.1103)

Infringement defendant failed to show by clear and convincing evidence that disclosure of patents in suit, as originally filed, did not provide support for later added claim limitation, since all issued claims are presumed valid, since plaintiff’s expert witness testified that in his opinion claims were properly fully supported, and since that testimony, although brief, provided substantial evidence supporting jury’s conclusion that claims are not invalid for failure to meet written description requirement.

[6] Patentability/Validity — Anticipation — Identity of elements (§115.0704)

Patentability/Validity — Obviousness — Relevant prior art — Particular inventions (§115.0903.03)

Substantial evidence supports jury’s conclusion that claims of patent for chemical analysis apparatus and method that require “flowing said solution along the medium” were not anticipated by prior art reference, since jury was instructed to give claim terms not defined by court their ordinary meaning, since jury could have reasonably interpreted language of claims as requiring that sample solution itself provide required flow, and since reference teaches use of “developing solution” in addition to sample solution to cause solution to flow; jury’s finding of nonobviousness is also supported by record, despite evidence that use of fluid sample to drive flow was known in prior art, since knowledge in prior art of every element of claim is not alone sufficient to show that person of ordinary skill in art would have been motivated to replace developing fluid/sample solution combination of reference with flow provided solely by sample fluid.

Particular Patents

Particular patents — Chemical — Chemical analysis

5,073,484, Swanson and Guire, quantitative analysis apparatus and method, judgment of noninfringement affirmed in part and reversed in part; judgment that patent is not invalid affirmed.

5,654,162, Guire and Swanson, chemical analysis apparatus and method, judgment of noninfringement affirmed; judgment that patent is not invalid affirmed.

Case History and Disposition

Appeal from the U.S. District Court for the Southern District of California, Huff, C.J.

Action by Abbott Laboratories against Syntron Bioresearch Inc. for patent infringement. Plaintiff appeals from judgment of noninfringement, and defendant cross-appeals from judgment that patents in suit are not invalid. Affirmed in part, and reversed and remanded in part.

Attorneys:

Lee Carl Bromberg, Joel R. Leeman, and Eric Paul Belt, of Bromberg & Sustein, Boston, Mass.; George C. Lombardi, of Winston & Strawn, Chicago, Ill.; Regina M. Anderson, of Abbott Laboratories, Abbott Park, Ill., for plaintiff-appellant.

David C. Doyle, Jill D. Neiman, Steven E. Comer, and Peng Chen, of Morrison & Foerster, San Diego, Calif., for defendant/cross-appellant.

Judge:

Before Mayer, chief judge, and Michel and Dyk, circuit judges.

Opinion Text

Opinion By:

Dyk, J.

Abbott Laboratories (“Abbott” or “appellant”) appeals from the judgment of the United States District Court for the Southern District of California that Syntron Bioresearch, Inc. (“Syntron” or “appellee”) did not infringe the asserted claims of United States Patent Nos. 5,073,484 (“the ‘484 patent”) and 5,654,162 (“the ‘162 patent”). *Abbott Labs. v. Syntron Bioresearch, Inc.*, No 98-CV-2359 (S.D. Cal. Oct. 12, 2001) (“Judgment”).

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Syntron cross-appeals from the judgment that the asserted claims are not invalid.

We affirm the judgment of noninfringement as to claim 26 of the ‘484 patent and claims 1, 22, 29, and 30 of the ‘162 patent. We reverse the judgment of non-infringement as to claims 22 and 23 of the ‘484 patent, and remand as to those claims. We affirm the judgment that the asserted claims are not invalid.

BACKGROUND

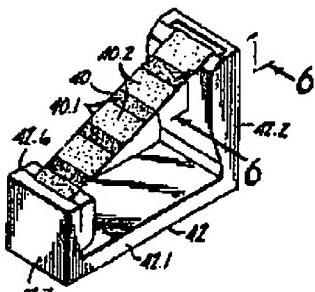
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Abbott is the exclusive licensee of the ‘484 and ‘162 patents (collectively “the patents-in-suit), respectively entitled “Quantitative Analysis Apparatus and Method” and “Chemical Analysis Apparatus and Method.” The written descriptions of the ‘484 and ‘162 patents are substantially identical, being generally directed to devices and methods for performing chemical analysis. The Field of the Invention sections of both patents described the technical field disclosed in the patents as follows:

The invention is in the field of quantitative chemical analysis, and is particularly useful in the detection and analysis of small amounts of chemical substance in such biological fluids as milk, blood, urine, etc. ‘484 patent, col. 1, ll. 10-13.1

The technology at issue involves the reaction of three chemical constituents: a substance to be detected (called an analyte, ligand, or antigen), a substance that is complementary to and binds to the substance to be detected (called a reactant or antibody), and an indicator (called a detector), which also binds to the substance to be detected. The patents are particularly directed to chemical analysis related to the immune system and its reactions. Proteins produced by the immune system bind to particular foreign substances as a natural defense mechanism. The technology at issue here exploits the ability of the immune system to create proteins (antibodies or reactants) that bind with particularity to a substance to be detected (ligand or analyte). The indicator and the reactant bind to the analyte. The reactant immobilizes the analyte, and the indicator provides an indication of the presence of the analyte. The indication can be one of two types, a qualitative indication or a quantitative indication. Qualitative analysis provides an indication of the presence or absence of the analyte in the sample. A quantitative indication provides information about the quantity of the analyte present in the test sample. In the disclosed invention quantitative analysis is performed using a device that includes a number of analyte detection zones, wherein the number of zones in which analyte is detected is directly proportional to the amount of analyte in the sample.

An exemplary embodiment of a test device as shown in figure 5 of the '484 patent is reproduced below. The test device includes a test medium comprised of a filter paper strip (40) that permits a liquid test sample to flow downward therethrough. The test medium contains reaction zones (40.1), which include therein reactant, bound to the medium within the reaction zones. As the test solution flows through the reaction zone, the reactant bound therein reacts by binding with the analyte (if any) present within the test sample. An indicator also reacts with the analyte (e.g., by binding therewith), thus providing a "moiety derived from [the] analyte, and desirably ...a tagged or labeled form of the analyte" called an "analyte derivative" that functions as an indication of the presence of the analyte.



In operation, the liquid sample is applied to the test strip and flows downward. The labeled or tagged analyte in the liquid sample is trapped by the reactant in the test zones. The label or tag associated with the analyte provides an indication of the analyte. The number

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of zones within which analyte is indicated provides a measurement of the concentration of the analyte within the liquid sample.

II

On December 30, 1998, Abbott filed a complaint for patent infringement against Syntron alleging infringement of both patents-in-suit and seeking damages and a permanent injunction. At trial the allegations of infringement were narrowed to claims 22, 23, and 26 of the '484 patent (of which claims 22 and 26 are independent) and claims 1, 22, 29, and 30 of the '162 patent (of which claims 1 and 22 are independent). Claim 22 of the '484 patent is exemplary of the asserted claims of that patent, and provides:

A method for the analysis of an analyte which is a member of a ligand-antiligand binding pair in a test solution comprising the steps of:

- (a) providing a non-diffusively immobilized reactant in each of one or more reaction zones spaced successively along a flow path defined by a liquid permeable medium, wherein said reactant is the other member of said binding pair and is capable of binding with the analyte to form a predetermined product;
- (b) flowing said solution along the medium and sequentially through the reaction zone(s); and
- (c) detecting the presence of analyte, said reactant or said predetermined product in the reaction zone(s), wherein the number of zones in which detection occurs is related to the presence of analyte in the solution.

Claim 1 of the '162 patent is exemplary of the asserted claims of that patent, and provides:

A device generating a signal indicative of the presence of an analyte in a liquid solution suspected of containing said analyte, said device comprising:

- (a) a liquid permeable solid medium comprising a solution contact portion and one or more spaced reactive zones separated from said contact portion;
- (b) a solution suspected of containing said analyte and having traversed said medium, including said reactive zone(s);
- (c) a reactant non-diffusively bound to said medium only at said reactive zone(s), said reactant being specific for and bound to said analyte or a reaction product comprising said analyte and a chemical moiety; and
- (d) a labeled antibody specific for and bound to said analyte or said reaction product in said reactive zone(s); wherein said device provides a detectable signal in said reactive zone(s) as an indication of the presence or absence of said analyte in said solution.

On January 4, 2001, the district court issued an order resolving disputed issues of claim construction. *Abbott Labs. v. Syntron Bioresearch Inc.*, No. 98-CV-2359 (S.D. Cal. Jan. 4, 2001) ("Claim Construction Order"). On September 25, 2001, the district court issued an order adopting supplemental claim constructions. *Abbott Labs. v. Syntron Bioresearch Inc.*, No. 98-CV-2359 (S.D. Cal. Sept. 25, 2001) ("Supplemental Claim Construction Order"). The constructions provided in the supplemental order were used as the basis for the jury instructions as to the claim terms "non-diffusively immobilized"; "non-diffusively bound"; "specific for"; "predetermined amount"; and "analyte."

On October 4, 2001, the jury returned a special verdict form finding the asserted claims of the patents-in-suit valid but not infringed. *Abbott Labs. v. Syntron Bioresearch Inc.*, No. 98-CV-2359 (S.D. Cal. Oct. 4, 2001) ("Special Verdict"). The jury found with respect to all of the asserted claims that Abbott failed to prove that the accused products included a "non-diffusively immobilized" or "non-diffusively bound" reactant. *Id.* at 1-3. The jury found that Abbott failed to prove that the accused products included "a reactant bound [to the reaction zone] which is specific for ... the analyte" as recited claims 1, 22, 29, and 30 of the '162 patent. *Id.* at 3. With respect to claim 26 of the '484 patent and claims 22, 29, and 30 of the '162 patent, the jury found that Abbott failed to prove that the accused products included "a predetermined amount of reactant" in the reaction zone. *Id.* at 2-3. The jury also found with respect to claim 26 of the '484 patent that Abbott failed to prove that "detection occurs ... only if analyte is present in the test solution in a predetermined amount." *Id.* at 2. As to validity and enforceability, the jury returned verdicts

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that Syntron failed to prove by clear and convincing evidence that the claims were anticipated, obvious, invalid due to inventorship error, lacked enablement or written description support, or were unenforceable due to inequitable conduct. *Id.* at 4-7.

On October 12, 2001, the district court entered judgment in favor of Syntron as to infringement and in favor of Abbott as to validity and unenforceability in accordance with the special verdict. *Abbott Labs. v. Syntron Bioresearch Inc.*, No. 98-CV-2359 (S.D. Cal. Oct. 12, 2001) (“*Judgment*”). Following judgment, Abbott and Syntron filed motions for JMOL and a new trial, which were denied. *Abbott Labs. v. Syntron Bioresearch Inc.*, No. 98-CV-2359 (S.D. Cal. Jan. 10, 2002) (“*Order Denying JMOL*”). Abbott filed a timely appeal of the final judgment. Syntron filed a timely cross-appeal. We have jurisdiction over the appeal and the cross-appeal under 28 U.S.C. §1295(a)(1).

DISCUSSION

We review the jury’s factual determinations for substantial evidence. *Union Carbide Chems. & Plastics Tech. Corp. v. Shell Oil Co.*, 308 F.3d 1167, 1177, 64 USPQ2d 1545, 1551 (Fed. Cir. 2002). This court reviews issues of claim construction and the propriety of jury instructions without deference. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456, 46 USPQ2d 1169, 1174 (Fed. Cir. 1998) (en banc). We review “[the] jury’s conclusions on obviousness, a question of law, without deference, and the underlying findings of fact, whether explicit or implicit within the verdict, for substantial evidence.” *LNP Engineering Plastics, Inc. v. Miller Waste Mills, Inc.*, 275 F.3d 1347, 1353, 61 USPQ2d 1193, 1197 (Fed. Cir. 2001).

I.

Abbott requests review of the jury findings as to four claim recitations: “non-diffusively bound”; “non-diffusively immobilized”; “specific for”; and “predetermined amount.” Abbott argues that under the proper claim construction the judgment of noninfringement cannot stand and that judgment of infringement should be entered in its favor or, alternatively, a new trial should be granted.

We must sustain the judgment of noninfringement as to an asserted claim if any one of the noninfringement findings as to that claim is based on proper jury instructions and is supported by substantial evidence. See *Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1328, 63 USPQ2d 1374, 1383 (Fed. Cir. 2002). Thus, in order to prevail as to a particular claim, Abbott must establish as to each ground of noninfringement that either (1) the jury instruction as to that element was erroneous and prejudicial, *Ecolab Inc. v. Parclipse, Inc.*, 285 F.3d 1362, 1373, 62 USPQ2d 1349, 1356 (Fed. Cir. 2002), or (2) the jury verdict was not supported by substantial evidence, *Cybor*, 138 F.3d at 1454, 46 USPQ2d at 1172.

A. Non-Diffusively Bound and Non-Diffusively Immobilized

Abbott argues that the jury’s finding of noninfringement based on the failure to satisfy the claim terms “non-diffusively bound” and “non-diffusively immobilized” is not sustainable because of error in the jury instruction.

All of the asserted claims require a reactant that is either “non-diffusively bound” or “non-diffusively immobilized.” The parties agree that these recitations as properly construed have the same meaning. The district court adopted, and instructed the jury using the following definition of “non-diffusively bound”:

Nondiffusively bound means a reactant immobilized in the reaction zone so as to provide a detectable signal indicating the presence or absence of analyte in the solution, and the reactant is not capable of detaching from the medium, spreading out, and moving along the test strip [A] reactant is nondiffusively bound *only if it is found in such a manner that a sufficient and reproducible amount of reactant remains bound in the reactive zone or zones to conduct both quantitative and qualitative assays*.

(Tr. at X-132.) Abbott objected to the district court’s construction, urging instead that the disputed recitations “require only that the reactant be immobilized sufficiently to permit detection of the analyte in the reaction zone.” (Appellant’s Br. at 25.).

On appeal Abbott urges that the adoption of an instruction including the underscored language was error because it interpreted the claim to require quantitative analysis. Syntron urges that the inclusion of the “quantitative”language in the jury instruction was proper.

The first step in the analysis is to determine the ordinary meaning of the claim terms. *Tex.*

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Digital Sys. v. Telegenix, Inc., 308 F.3d 1193, 1202, 64 USPQ2d 1812, 1817 (Fed. Cir. 2002); *see also Inverness Med. Switz. GmbH v. Warner Lambert Co.*, 309 F.3d 1373, 1378, 64 USPQ2d 1933, 1936 (Fed. Cir. 2002); *Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1582, 39 USPQ2d 1573, 1576 (Fed. Cir. 1996). Dictionary definitions provide evidence of a claim term’s “ordinary meaning.” *Inverness*, 309 F.3d at 1378, 64 USPQ2d at 1936. The parties have conceded that the recitations “non-diffusively bound” and “non-diffusively immobilized” are to be construed consistently. Starting with the words themselves, “non-diffusively” is an adverb defining the verbs “immobilized” and “bound.” Webster’s defines “bound” as “held in chemical or physical combination: COMBINED.” *Webster’s Third International Dictionary* 260 (1968) (“*Webster’s*”). Webster’s defines “immobilize” as “to make immobile: fix in place or position: render incapable of movement.” *Id.* at 1130. The plain meaning of “immobilized” requires that the reactant not move relative to the medium, and the recitation “bound” further defines how that immobilization is provided, by requiring that the reactant be chemically or physically combined with the medium so as to be immobilized.

“Diffusively”defines the degree or character of the recitations “bound” and “immobilized.” “Diffusive”, the adverb form of which is “diffusively”, means “having the quality of diffusing: tending to diffuse: characterized by diffusion.” *Id.* at 631. Webster’s defines diffusion as “the process whereby particles (as molecules and ions) of liquids, gases, or solids intermingle as the result of their spontaneous movement caused by thermal agitation *and in dissolved substances move from a region of higher concentration to one of lower concentration.*” *Id.* at 631 (emphasis added). Thus, a dissolved substance that moves diffusively moves from a region of high concentration to one of lower concentration within the liquid, *i.e.*, disperses within the liquid.

[1] Taking the words together, the plain meaning of “non-diffusively bound” and “non-diffusively immobilized” is — a chemical or physical combination of the reagent and the medium, such that the reagent does not dissolve and move within the liquid from a region of high concentration to a region of low concentration. This definition closely mirrors the first portion of the construction adopted by the district court — the reactant is not capable of detaching from the medium, spreading out, and moving along the test strip — but bears no resemblance to the underscored portion of the instruction. None of the pertinent dictionary definitions supports the underscored portion. The plain meaning of the claim recitation, therefore, does not support the district court’s narrowing construction.

The usage of the disputed claim terms in the context of the claims as a whole also informs the proper construction of the terms. See *RF Del., Inc. v. Pac. Keystone Techs., Inc.*, 326 F.3d 1255, 1263-64, 66 USPQ2d 1593, 1598 (Fed. Cir. 2003). Here, the language of the asserted claims suggests that quantitative analysis should not be read as a requirement of the recitations “non-diffusively bound” or “non-diffusively immobilized.” In claim 22 of the '484 patent, for example, element (c) requires “detecting the presence of analyte.” Similar language is found in each of the asserted claims. This language is broad enough to encompass both qualitative and quantitative analysis, and therefore, militates against the narrow definition used to instruct the jury. Syntron appears not to argue to the contrary on appeal. Rather, Syntron urges that the underscored language, in fact, broadens rather than narrows the construction of “non-diffusively bound.” (Appellee’s Br. at 20.) According to Syntron, the jury instruction did not require “quantitative analysis,” but rather defined the quality of binding between the reactant and the test strip. We cannot agree, as the language “sufficient and reproducible amount of reactant remains ... to conduct both quantitative and qualitative assays” is an additional requirement beyond the ordinary meaning of the claim language.²

Thus, the construction adopted by the district court and used to instruct the jury was erroneous insofar as it included the underscored language requiring a sufficient amount to conduct quantitative assays. Because we have found that the jury was improperly instructed,

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and Syntron does not argue that the instruction was harmless error, we cannot affirm the judgment of noninfringement on the basis of the accused products’ not incorporating a “non-diffusively bound” and “non-diffusively immobilized” reactant. Abbott urges that we enter JMOL in its favor instead of ordering a new trial. However, we think the issue of whether JMOL or a new trial should be granted is an issue best addressed in the first instance by the district court. Moreover, we must determine whether the judgment of noninfringement as to any of the claims can be sustained on other grounds.

B. Specific For

The jury also found noninfringement of claims 1, 22, 29, 30 of the '162 patent because it concluded that the accused device did not meet the “specific for” claim recitation. Abbott urges that the district court’s construction of “specific for” was in error, and that JMOL of infringement in its favor as to those elements should have been entered or a new trial granted. Abbott urges that the jury instruction included two errors, the inclusion of the language “particular to” in the instruction and the failure to instruct the jury that the claim language “does not mean that the reactant must bind only one analyte.” (Appellant’s Br. at 50-52.)

As to the first assigned error, the inclusion of the language “particular to,” Abbott waived this argument by agreeing to that portion of the adopted construction. The jury instruction for “specific for” stated that the term meant “particular to and capable of binding with the analyte or chemical moiety of interest.” (Tr. at X-133.) The district court further stated that “[p]articular to means capable of preferentially reacting or binding with the analyte or chemical moiety from among the thousands of molecules potentially in the test sample.” *Id.* The disputed phrase was present in the proposed jury instructions submitted by Abbott.³ (J.A. at 8006.) Abbott also stated during trial “the Court has defined [specific to] to mean particular to and capable of binding with the analyte of interest, [a]nd the Plaintiff believes that that ... claim term is properly defined.” (Tr. at VIII-212.) Abbott cannot wait until after the jury returns a verdict against it and then on JMOL request a different construction by attempting to have the district court delete a portion of the construction that Abbott itself agreed to. *See Interactive Gift Express, Inc. v. Compuserve Inc.*, 256 F.3d 1323, 1345-46, 59 USPQ2d 1401, 1418 (Fed. Cir. 2001) (holding that the presentation of the adopted construction to the district court constituted a waiver, precluding the party from proposing a new construction either on JMOL or on appeal). Abbott, therefore, cannot assign error to the district court’s use of a definition including the language “particular to.” The jury in reaching its verdict was bound by the district court’s instruction construing the claims. The jury was not charged with the task of reaching a new claim construction through review of the sources used in interpreting the claims such as dictionaries, the specification, or the prosecution history.

Regarding the second error urged by Abbott — the failure to instruct the jury that “‘particular to’ does not mean that the reactant must bind only one analyte” — the instruction adopted by the district court implicitly incorporated this portion of the proposed instruction. Specifically, the jury instruction stated that “[p]articular to means capable of *preferentially* reacting or binding with.” (Tr. at X-133) (emphasis added). The jury instruction did not require that the reaction occur solely with the analyte, but rather that the reaction with the analyte be the preferred reaction. Thus, the additional language urged by Abbott was redundant of language that it also proposed and which the court used to instruct the jury. There was no error, therefore, in failing to instruct the jury that “‘particular to’ does not mean that the reactant must bind only one analyte.”

In addition to errors in the jury instruction, Abbott also argues that substantial evidence does not support the jury verdict and that judgment of infringement is required under the district court’s instruction. Even where a

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party proposes the adopted instruction, that party is not estopped from arguing that the jury failed to properly apply that instruction. *Moba, B.V. v. Diamond Automation, Inc.*, 325 F.3d 1306, 1314, 66 USPQ2d 1429, 1434 (Fed. Cir. 2003). In *Moba* the district court refused to grant JMOL based on the jury’s implicit interpretation of the agreed-upon claim construction. *Id.* On appeal, *Moba* argued that because Diamond had agreed to the construction used to instruct the jury, it was estopped from contesting the verdict. *Id.* This court reversed, holding that Diamond was not so estopped because it was simply arguing that there was a lack of substantial evidence to support the verdict under the district court’s own instructions. *Id.* As the court explained, “Diamond [did] not wish to alter the district court’s claim construction on appeal, but [sought] enforcement of the trial court’s claim construction.” *Id.*

[2] Here, under the district court’s claim construction, the jury found that the accused devices did not include “a reactant ...which is specific for ... the analyte.” The undisputed evidence showed that the reactant employed in the accused devices binds identically to the analyte (human chorionic gonadotropin — “hCG”) and to another protein called luteinizing hormone (“LH”) that possesses an identical protein binding site to that of hCG. *Order Denying JMOL* at 23. The agreed upon claim construction, however, required the reagent to be “capable of *preferentially reacting or binding with the analyte ... from among the thousands*

of molecules potentially in the test sample.” (Tr. at X-133.) The undisputed fact, as admitted by Abbott’s own witness, is that the reactant employed by Syntron in the accused devices binds *identically* with the analyte (hCG) and another substance (LH). (Tr. at III-116). Thus, the jury could have reasonably concluded that the reagent did not *preferentially* bind with the analyte from among the thousands of molecules. The issue here is solely whether the jury could have reasonably concluded that the reagent did not meet the recitation as construed by the district court in the instructions. We conclude that it could have. On this ground, therefore, we affirm the judgment of noninfringement as to claims 1, 22, 29, 30 of the ‘162 patent.

C. Predetermined Amount 4

The jury found noninfringement of claim 26 of the ‘484 patent, concluding that the accused device did not meet the “predetermined amount” claim recitation. The district court defined “predetermined amount” as “an amount determined beforehand” and instructed the jury accordingly. (Tr. at X-133.) Abbott does not challenge the instruction as such (having agreed to the instruction at trial), but for purposes of JMOL seeks to interpret the claim language more broadly, *i.e.*, “[t]he amount of analyte or bound reactant need not be precisely known or reproducible.” (Appellant’s Br. at 37.) As we have discussed above, Abbott cannot seek to modify an agreed claim construction on appeal. *See Interactive Gift Express*, 256 F.3d at 1345-46, 59 USPQ2d at 1418.

[3] The jury found that the accused devices did not include an “an amount determined beforehand” as required under the construction adopted for this recitation. *Special Verdict* at 2-3. The district court refused to grant JMOL that Syntron infringed this limitation. *Order Denying JMOL* at 28. As stated by the district court:

The record suggests that the amount of bound antibody [in the accused devices] is unknown and variable from test to test.... Syntron’s manufacturing process merely involves placing the 1001 capture antibody solution on the test strip, and “eyeballing” it to make sure that the solution is on it.

Id. at 29. Based on this evidence the district court concluded that a reasonable jury could have found that the amount of reactant was not determined beforehand.⁵ *Id.* We agree with the district court that a reasonable jury

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could have found that the amount of reagent was not determined beforehand. Thus, we affirm the judgment of noninfringement as to claim 26 of the ‘484 patent.

D. Analyte

Syntron seeks to alternatively support the judgment of noninfringement as to claims 22 and 23 of the ‘484 patent based on the argument that the district court’s construction of the claim term “analyte” in those claims was erroneous, and that under the proper claim construction no reasonable jury could have found that the limitation was satisfied.

The district court construed “analyte” to mean “the substance of interest, *i.e.*, the substance that the test is designed to detect if present in the liquid being tested.” Syntron objected to this construction before the district court and urges on appeal that the district court should have instructed the jury that the “analyte” limitation required quantitative analysis. Syntron does not argue that the plain meaning of the word “analyte” requires quantitative measurement. Nor could it. Although the word “analyte” is not defined in general dictionaries of the English language, the term is used in specific fields of technology including analytical chemistry, and within that field is defined as the component of a sample that is to be determined. *See, e.g.*, Douglas A. Skoog et al., *Fundamentals of Analytical Chemistry* 1 (7th ed. 1996) (“The components of a sample that are to be determined are often referred to as analytes.”). This definition corresponds closely to the definition adopted by the district court, that is, “the substance that the test is designed to detect if present in the liquid being tested.”

[4] The law is clear, however, that a patentee may be his own lexicographer (*see Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1249, 48 USPQ2d 1117, 1121 (Fed. Cir. 1998)), and Syntron argues that Abbott did so here, defining analyte to require quantitative analysis because the patentee explicitly defined the term in the specification as “any chemical moiety which is to be measured quantitatively.” (Appellee’s Br. at 40.). However, “[t]he patentee’s lexicography must, of course, appear ‘with reasonable clarity, deliberateness, and precision’ before it can affect the claim.” *Id.* (emphasis added) (quoting *In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994)). Thus, the issue is whether the patentee here defined “analyte” with reasonable clarity, deliberateness, and precision. The definition cited by Syntron is provided in the Summary of the Invention section of the patents-in-suit, and provides in its entirety:

As used herein, “analyte” refers not only to the particular chemical moiety for which analysis is desired, but also to chemical moieties that are reaction products of the moiety to be determined with another chemical moiety. For example, a biological fluid containing an unknown amount of a chemical moiety may be reacted in solution or otherwise with another chemical moiety to provide a product, the concentration of which is related to the initial concentration of the chemical moiety to be measured. The resulting product, then, may become the “analyte” for use in the apparatus and method of the invention. Accordingly, “analyte” refers to any chemical moiety which is to be measured quantitatively.

⁴⁸⁴ patent, col. 3, ll. 18-31.

We hold that the passage cited by Syntron, taken in context, does not provide reasonable clarity, deliberateness, and precision sufficient to narrow the definition of the claim term in the manner urged. The first portion of the cited passage defines the word “analyte” in terms of the “moiety for which analysis is desired” and “reaction products of the moiety.” *Id.* at col. 3, ll. 18-22. This portion of the definition comports with the district court’s definition of the word as the substance of interest. The last sentence provides a different definition. Because the specification provides two alternative definitions for the term at issue, the specification does not define the claim term in the manner required under *Renishaw*. As correctly construed, therefore, the ordinary meaning of “analyte” as used to instruct the jury is the proper construction, and there is no basis for setting aside the verdict of noninfringement of claims 22 and 23 of the '484 patent on this ground.

E. Doctrine of Equivalents

On August 20, 2002, Abbott filed its reply brief on appeal, arguing for the first time that a new trial should be granted on the issue of infringement under the doctrine of equivalents. Abbott bases this argument on the issuance of the Supreme Court's decision in *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 535 U.S. 722 [62 USPQ2d 1705] (2002),

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rejecting the complete bar approach to prosecution history estoppel adopted by our earlier decision in *Festo Corp. v. Shoketsu Kinzoku Kogyo Kabushiki Co.*, 234 F.3d 558, 56 USPQ2d 1865 (Fed. Cir. 2000) (en banc). (Appellant's Reply Br. at 17-19.) Abbott argues that it could not have addressed this issue any earlier than May 28, 2002, the date of the Supreme Court's decision. Abbott was on notice that our decision in *Festo* might be reversed by the Supreme Court, and was obligated to present the issue if it wanted to have the benefit of the Supreme Court's decision.⁶ Abbott has waived the doctrine of equivalents argument by failing to raise it in its opening brief. *Amhil Enters. Ltd. v. Wawa, Inc.*, 81 F.3d 1554, 1563, 38 USPQ2d 1471, 1477 (Fed. Cir. 1996) (stating that a reply brief should "reply to the brief of the appellee" and "is not the appropriate place to raise, for the first time, an issue for appellate review") (internal citation omitted).⁷

In summary, we affirm the judgment of noninfringement as to claims 1, 22, 29, and 30 of the '162 and as to claim 26 of the '484 patent. However, remand is necessary as to claims 22 and 23 of the '484 patent on the issue of infringement because of the erroneous claim construction.

II.

Syntron also cross appeals the judgment that claims 22, 29, and 30 of the '162 patent are not invalid for lack of written description, and that the asserted claims of the '484 patent are not anticipated or rendered obvious by U.S. Patent No. 4,094,647 to Deutsch et al. ("Deutsch") issued June 13, 1978.⁸ Even though we have sustained the judgment of noninfringement as to some of these claims, we must nevertheless address the issues of validity raised by the counterclaims in view of the Supreme Court's decision in *Cardinal Chemical Co. v. Morton International*, 508 U.S. 83, 93-94 [26 USPQ2d 1721] (1993) (requiring a counterclaim of invalidity to be addressed without regard to a determination of noninfringement).

[5] At trial the burden was on Syntron to prove by clear and convincing evidence that the written description requirement of 35 U.S.C. §112, ¶ 1, was not met. Compliance with the written description requirement is a question of fact, which is reviewed for substantial evidence. *SunTiger, Inc. v. Scientific Research Funding Group*, 189 F.3d 1327, 1334, 51 USPQ2d 1811, 1815 (Fed. Cir. 1999). The dispute here centers upon whether the disclosure, as originally filed, provided support for the later added claim limitation "diffusively bound." The district court construed this recitation to mean "bound to the solid medium in such a way that the labeled antibody is capable of detaching from the medium, spreading out, and moving along the test strip."(Tr. at X-131.) Abbott cites the following text from the '162 specification as providing the necessary written description support:

In a preferred embodiment, only a single pass through the apparatus of a single liquid material is required. An analyte may be mixed with an analyte derivative, chromogen or other material and flowed through the apparatus to yield an appropriate test result. In a further preferred embodiment, the apparatus is chemically complete in that it includes all reactants and other chemicals necessary or desirable for the quantitative analysis of an analyte; that is, all that is required is that the analyte in a liquid carrier be flowed through the apparatus. Elements of the apparatus that, if combined, would undergo reaction in the absence of the analyte may be maintained in different zones. For example, the bottom-most layer (20.2) of the strip of FIG. 2 may contain a reactant physically separated from reactants in the adjacent reaction zone. When the analyte

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in a carrier liquid is flowed through the layer (20.2), the reactant in this layer together with the analyte and carrier liquid is flowed into the first reaction zone. *If desired, a reactant may be provided in the form of a solid and may merely be placed upon the upper layer (18.4) of the column of FIG. 1, the reactant being dissolved by and carried with the liquid carrier and analyte into the column.*

'162 patent, col. 12, l. 62 — col. 13, l. 15. Thus, the cited passage teaches placing solid reactant on the upper layer of the test device to be dissolved by the liquid carrier. An expert witness for Abbott testified that in his opinion the claims of both patents were properly fully supported. (Tr. at II-156-57.) That testimony, while brief, did provide substantial evidence supporting the jury verdict. *See Union Oil Co. v. Atl. Richfield Co.*, 208 F.3d 989, 999, 54 USPQ2d 1227, 1234 (Fed. Cir. 2000). Moreover, all issued claims are presumed valid. 35 U.S.C. §282 (2000). The evidentiary burden, therefore, was on Syntron and not Abbott. Syntron failed to prove that, in light of the presumption of validity, no reasonable jury could have decided that Syntron failed to prove by clear and convincing evidence that the claims are invalid for failure to meet the written description requirement.

Finally, as to the question of the validity of the asserted claims of the '484 patent over Deutsch, that reference was of record during the prosecution of both patents in suit. The presumption of validity remains the same whether or not the art relied upon at trial was before the examiner. *SIBIA Neurosciences, Inc. v. Cadus Pharm. Corp.*, 225 F.3d 1349, 1355-56, 55 USPQ2d 1927, 1931 (Fed. Cir. 2000). However, the fact that a skilled examiner passed upon that very reference during prosecution may be a factor in determining whether the challenger has met the clear and convincing evidence burden. *Id.; Alco Standard Corp. v. Tenn. Valley Auth.*, 808 F.2d 1490, 1497, 1 USPQ2d 1337, 1342 (Fed. Cir. 1986).

With respect to anticipation under 35 U.S.C. §102, the dispute concerns whether Deutsch teaches “flowing said solution along the medium” as required by the asserted claims. As described by Syntron, Deutsch teaches using a “developing fluid” in addition to the sample solution to cause the solution to flow. (Appellee’s Br. at 47.) The issue, therefore, is whether the combination of developing fluid and test sample in Deutsch meets the claim language “flowing said solution along the medium.”

[6] The disputed claim language was not separately addressed by the district court, nor did the parties request a jury instruction concerning this language. The jury instructions stated that the jury “should give any terms not defined by [the court] their ordinary meaning.” (Tr. at X-135.) Since Syntron did not urge a particular claim construction of the disputed language before the district court, it has waived the right to do so on appeal. We agree with Abbott that the jury could have reasonably interpreted the language of the claims standing alone as requiring that the solution itself provide the required flow. (Appellant’s Reply Br. at 23.) The burden having been on Syntron to prove by clear and convincing evidence that the claims were anticipated, we cannot conclude that the jury verdict on anticipation was not supported by substantial evidence.

Syntron further argues that even if the claims required that the solution itself provide the recited flow, the claims as interpreted would be rendered obvious by Deutsch under 35 U.S.C. §103. Syntron cites a statement by an expert for Abbott that the use of the fluid sample to drive the flow was known in the prior art. (Appellee's Br. at 51.) Knowledge in the prior art of every element of a patent claim, however, is not of itself sufficient to render the claim obvious. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 [149 USPQ2d 459] (1966); *Teleflex*, 299 F.3d at 1333-34, 63 USPQ2d at 1386. The issue is whether substantial evidence supports the judgment (under the clear and convincing evidence standard) that a person having ordinary skill in the art would not have been motivated to replace the developing fluid/sample solution combination of Deutsch with flow provided solely by sample fluid. Upon review of the evidence presented on the issue of obviousness in view of Deutsch, and in view of the burden of proof, we sustain the judgment of non-obviousness.

CONCLUSION

Thus, we affirm the judgment of noninfringement as to claim 26 of the '484 patent and claims 1, 22, 29, and 30 of the '162 patent. We also affirm the judgment on validity of all the asserted claims. Finally, we reverse

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the judgment of noninfringement as to claims 22 and 23, and remand for further proceedings consistent with this opinion.

AFFIRMED IN PART AND REVERSED AND REMANDED IN PART

COSTS

No costs.

Footnotes

1 In view of the substantial identity between the written descriptions of the two patents, citation will be made to the '484 patent as exemplary of both patents-in-suit.

2 Syntron also cites the description of the disclosed invention in the specification as using "covalent bonding" between the reactant and the test strip as somehow supporting the district court's adopted jury instruction. (Appellee's Br. at 21-22.) The description in the specification of a particular embodiment does not require that the claims be limited to that embodiment. See *Brookhill-Wilk I, LLC v. Intuitive Surgical, Inc.*, No. 02-1145, slip op. at 12 (Fed. Cir. June 27, 2003).

3 Abbott's proposed jury instruction provided in full:

"*specific for*" means "particular to and capable of binding with." The words "particular to" do not mean that the reactant (e.g., and antibody) will bind one and only one analyte. Rather, "particular to" means the reactant is capable of preferentially reacting or binding with the analyte (or the reaction product of the analyte with another chemical moiety) from among the thousands of molecules potentially in the test sample. The reactant may also bind with other related molecules that share common structures. (J.A. at 8006 (emphasis in original)).

4 The claim language "predetermined amount" is recited in a number of claims. However, only claim 26 of the '484 patent is addressed in this section, as the verdicts of noninfringement as to the remainder of the claims containing that language are being affirmed on other grounds.

5 On appeal Abbott cites testimony from one of Syntron's witnesses purporting to prove that the amount of reagent is determined in advance. (Appellant's Br. at 40.) That testimony, however, was in response to the following question: "isn't it true that Syntron controls the amount of each ingredient that you use in *the production of your antibody solution?*" (Tr. at VIII-69) (emphasis added). The cited testimony, therefore, was directed to the amount of reagent incorporated in the solution to be applied to the test strip, and not the amount of reagent that is placed on the test strip.

6Indeed, the district court's order granting judgment as a matter of law addressed the issue of prosecution history estoppel under both our decision in *Festo*, and the preexisting flexible bar approach, recognizing that certiorari had been granted in *Festo*. *Abbott Labs. v. Syntron Bioresearch, Inc.*, No 98-CV-2359 slip op. at 13 (S.D. Cal. Oct. 9, 2001) ("Order Granting JMOL") ("[E]ven if the flexible bar that *Festo* rejected were to control again, prosecution history estoppel would bar Abbott from relying on the doctrine of equivalents for the elements in dispute.").

7Abbott also appears to have raised the issue of prosecution history estoppel for the first time in its reply brief during briefing on JMOL. *Order Denying JMOL* at 32. The district court chastised Abbott for this behavior, but "nonetheless address[ed] those arguments for the sake of completeness." *Id.*

8No issue is raised on appeal with respect to the enforceability of the patents-in-suit.

- End of Case -

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Texas Digital Systems Inc. v. Telegenix Inc.

U.S. Court of Appeals Federal Circuit

No. 02-1032

Decided October 16, 2002

Headnotes

PATENTS

[1] Patent construction — Claims — In general (§125.1301)

Patent construction — Claims — Defining terms (§125.1305)

Dictionaries, encyclopedias, and treatises are reliable and objective sources of information for established meanings that would be attributed to claim terms by one skilled in art, and thus are not “extrinsic evidence” of meaning of claim terms, since such references are unbiased reflections of common understanding that are not influenced by expert testimony, colored by parties’ motives, or inspired by litigation; such materials may be consulted by trial and appellate judges at any stage of litigation, regardless of whether party has offered them into evidence, but intrinsic

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record must always be consulted to identify which of different possible dictionary meanings for claim terms at issue is most consistent with words used by inventor, and to determine whether presumption of ordinary and customary meaning is rebutted.

[2] Patent construction — Claims — In general (§125.1301)

Patent construction — Claims — Defining terms (§125.1305)

Dictionaries, encyclopedias, and treatises should be consulted to determine meaning of disputed claim terms before intrinsic evidence is examined for this purpose, since consulting written description and prosecution history as threshold step in claim construction process, before any effort is made to discern ordinary and customary meanings attributed to words themselves, invites violation of rule against importing limitations into claims.

[3] Patent construction — Claims — Defining terms (§125.1305)

Phrase “repeatedly substantially simultaneously activating,” in claims of patents directed to devices for controlling color of pixels in light emitting diode display, is properly construed to require that during some portion of period defined as “repeatedly,” two separate lights are turned on at same or nearly same time, since that construction comports with ordinary meaning of “activating” derived from technical dictionary, and since there is nothing in record to suggest that “activating” means anything other than what dictionary definition would suggest, namely, “starting the operation” or “turning on.”

[4] Patent construction — Claims — Defining terms (§125.1305)

Phrase “selectively controlling the durations of the time intervals of activation,” in claims of patents directed to devices for controlling color of pixels in light emitting diode display, is properly construed to mean controlling width of pulses during repetition periods, since ordinary meaning of words themselves supports conclusion that limitation requires control of pulse width, and since this construction is entirely consistent with intrinsic evidence.

[5] Patent construction — Claims — Means (§125.1307)

Function of means-plus-function claim must be derived from language of claim itself, since 35 U.S.C. §112 does not permit limitation of such claim by adopting function different from that explicitly recited in claim; in present case, federal district court erred to extent it failed to follow claim language in defining function of limitation in issue, and compounded its error by misidentifying corresponding structure in specification.

[6] Patent construction — Claims — Defining terms (§125.1305)

Terms “display areas” and “background area,” as used in claims of patents directed to devices for controlling color of pixels in light emitting diode display, are properly construed as describing areas that are distinct and not interchangeable, since ordinary meaning of these limitations does not indicate that areas are interchangeable, and since specification and prosecution history support construction that requires display and background areas to be mutually exclusive; although specification indicates that display area pixels may be illuminated in background color, background pixels may not be illuminated in display color.

[7] Patent construction — Claims — Broad or narrow (§125.1303)

Patent construction — Claims — Means (§125.1307)

Federal district court erred in construing “converter means” limitation in claim directed to device for controlling color of pixels in light emitting diode display, even though court correctly identified recited function, since court used testimony of plaintiff's expert to broaden its view of corresponding structure beyond that disclosed in specification and prosecution history, and since expert testimony regarding meaning of claim is entitled to no weight if, as in present case, patent documents are unambiguous.

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[8] Patent construction — Claims — In general (§125.1301)

JUDICIAL PRACTICE AND PROCEDURE

Procedure — Jury trials (§410.42)

Federal district court's issuance of jury instructions containing claim construction errors constituted prejudicial legal error in patent infringement action, since record shows that defendant warned court concerning court's failure to properly construe claims, and that defendant proposed constructions of disputed claim limitations that would have corrected flawed constructions.

[9] Procedure — Evidence — In general (§410.3701)

Federal district court did not abuse its discretion by excluding witness testimony that patent infringement defendant sought to admit for purpose of showing that inventions of patents in suit were in public use more than one year prior to original application date, since corroboration is required of any witness whose testimony alone is asserted to invalidate patent, regardless of his or her level of interest in litigation, and court did not abuse its discretion in concluding that corroboration was insufficient in present case, and since witness could not establish particular date of prior public use, which is critical consideration for statutory bar, and court properly found such testimony unreliable and potentially confusing to jury.

[10] Procedure — Evidence — Expert testimony (§410.3703)

Federal district court did not abuse its discretion by admitting into evidence revised report of plaintiff's expert on patent damages, since evidence supports finding that expert was competent and qualified, in that expert owned and managed two patent licensing companies following his manufacturing work in field of inventions of patents in suit, and since defendant's complaints concerning content of report go to evidentiary weight of report, not its admissibility.

REMEDIES

[11] Monetary — Damages — Patents — In general (§510.0507.01)

Patent marking statute, 35 U.S.C. §287(a), describes circumstances that effect forfeiture of damages, not when or under what circumstances damages may be recovered; recovery of damages is not limited if there is no failure to mark, that is, if proper patent notice appears on products, or there are no products to mark, and statute thus does not require patentee who does not produce patented device to give notice to infringer before damages can be recovered.

Particular Patents

Particular patents — Electrical — Light emitting diode displays

4,845,481, Havel, continuously variable color display device, judgment of infringement reversed and remanded.

4,965,561, Havel, continuously variable color optical device, judgment of infringement reversed and remanded.

4,734,619, Havel, display device with variable color background, judgment of infringement reversed and remanded.

4,804,890, Havel, variable color complementary display device, judgment of infringement reversed and remanded.

Case History and Disposition

Appeal from the U.S. District Court for the Northern District of Texas, Stickney, J.

Action by Texas Digital Systems Inc. against Telegenix Inc. for patent infringement. Defendant appeals from jury verdict and entry of judgment that defendant literally infringed patents in suit, from award of reasonable royalty, enhanced damages, and pre- and post-judgment interest, and from issuance of permanent injunction. Affirmed in part, reversed in part, and remanded.

Attorneys:

Richard L. Schwartz and Inge A. Larish, of Winstead Sechrest & Minick, Dallas, Texas, for plaintiff-appellee.

Gregory J. Lavorgna, Joseph R. DelMaster Jr., Robert E. Cannuscio, and Stephen B. Schott, of Drinker, Biddle & Reath, Philadelphia, Pa., for defendant-appellant.

Judge:

Before Michel, Schall, and Linn, circuit judges.

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Opinion Text

Opinion By:

Linn, J.

Telegenix, Inc. ("Telegenix") appeals from the final judgment of the United States District Court for the Northern District of Texas in favor of Texas Digital Systems, Inc. ("TDS"). Because the district court erroneously construed certain disputed claim limitations, but correctly construed other claim limitations, we affirm-in-part, reverse-in-part, and remand.

BACKGROUND

TDS is the current owner of the four patents at issue, U.S. Patent Nos. 4,845,481 ("481 patent"), 4,965,561 ("561 patent"), 4,734,619 ("619 patent"), and 4,804,890 ("890 patent"), each issued to Karel Havel. TDS obtained these patents from Havel in 1997.

The Havel patents are directed to methods and devices for controlling the color of pixels in a light emitting diode ("LED") display. Each pixel includes at least two elements corresponding to different primary colors, e.g., one red element and one green element. Light signals from the two elements may be blended to produce a composite light signal of variable color. Figure 1 of the '481 patent, reproduced below, shows seven pixels arranged in a familiar seven-segment display pattern, each pixel having a red element (i.e., 2a-2g) and a green element (i.e., 3a-3g).

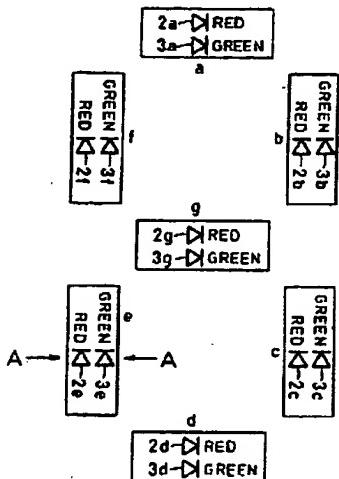


FIG. 1

Claims 1 and 2 of the '481 patent are representative of the asserted claims of the '481 and '561 patents:

1. A method for controlling a color of a variable color display device which comprises a plurality of *display areas arranged in a pattern* for selectively exhibiting a plurality of display units, each said display area including a plurality of light sources for emitting upon activation light signals of respectively different primary colors and means for combining said light signals to obtain a composite light signal of a composite color, by exhibiting a selected display unit by *repeatedly substantially simultaneously activating* the light sources in selected display areas for brief time intervals to cause the light sources to emit light signals of said primary colors, and by *selectively controlling the durations of the time intervals of activation* of the light sources in the selected display areas to control the portions of the primary color light signals emitted therefrom, to thereby control the color of the exhibited display unit. (emphases added).

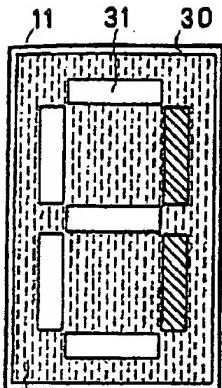
2. A variable color display device comprising:

a plurality of variable color *display areas arranged in a pattern* for selectively exhibiting a plurality of display units, each said display area including a plurality of light sources or emitting upon activation light signals of respectively different primary colors and means for combining said light signals to obtain a composite light signal of a composite color;

means for exhibiting a selected display unit by *repeatedly substantially simultaneously activating* the light sources in selected display areas by pulses of a substantially constant amplitude for causing the light sources to emit light signals of said primary colors; and

color control means for selectively controlling the durations of the pulses applied to the light sources in the selected display areas to control the portions of the primary color light signals emitted therefrom, to thereby control the color of the exhibited display unit. (emphases added)

The '619 patent is directed to display devices including a variable color background



³² FIG. 1a

Claim 1 of the '619 patent is representative of the claims and is reproduced below:

1. A variable color display device comprising:

a plurality of variable color *display areas arranged in a pattern*, each said display area including a plurality of display light sources for emitting upon activation light signals of different colors and means for combining said light signals to obtain a composite light signal of a composite color;

a variable color background area substantially surrounding said display areas and including a plurality of background regions adjacent to said display areas, each said background region including a plurality of light sources for emitting upon activation light signals of different colors and means for combining said light signals to obtain a composite light signal of a composite color;

a plurality of opaque walls for optically separating said background regions from adjacent display areas; and

means for selectively activating said display light sources, to illuminate certain of said display areas in a first color, and said background light sources, to illuminate said background regions in a second color different from said first color. (emphases added)

The '890 patent is directed to a variable color LED display and display circuit as illustrated in Figure 3, reproduced below:

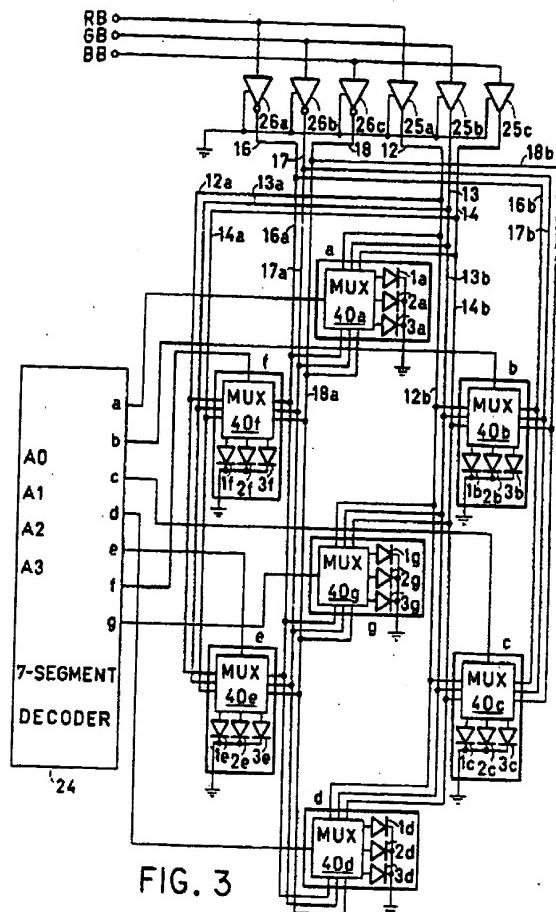


FIG. 3

Representative claim 4 of the '890 patent is reproduced below:

4. A display device comprising:
a plurality of variable color display areas arranged in a pattern for selectively exhibiting a plurality of display units, each said display area including a plurality of light sources for emitting upon activation light signals of different colors and means for

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combining said light signals to obtain a composite light signal of a composite color;
first means for carrying selective display color control signals;
converter means for converting said display color control signals to obtain complementary color control signals;
second means for carrying said complementary color control signals; and
control means for selectively coupling said light sources in said display areas to said first means, for causing selective ones of said display areas to illuminate in a selected color defined by said display color control signals, and to said second means, for causing the remaining display areas to illuminate in a substantially complementary color defined by said complementary color control signals. (emphases added)

After TDS obtained the Hayel patents in 1997, TDS filed suit, alleging that Telegenix's Colorgraphix devices infringed each of them. Following a jury verdict in favor of TDS, the district court entered judgment that Telegenix had literally infringed claims 1-4 and 7 of the '481 patent, claims 1-4 of the '561 patent, claim 1 of the '619 patent, and claim 4 of the '890 patent. The district court also found each of the asserted claims not invalid and concluded that Telegenix had willfully infringed "one or more" of the four asserted patents.

The district court awarded TDS a reasonable royalty of 20% as applied to \$30 million in infringing sales (i.e., \$6 million), enhanced damages of \$6 million, pre-judgment interest of \$3,007,999, post-judgment interest at 6.5%, and costs. The district court also permanently enjoined Telegenix from making, using, selling, or offering to sell its Colorgraphix color display devices, versions of its software used with the Colorgraphix color display devices, or other devices that otherwise infringe.

Telegenix appeals. We have jurisdiction pursuant to 28 U.S.C. §1295(a)(1).

ANALYSIS

Standard of Review

Claim construction is a question of law that this court reviews de novo. *Cybor Corp. v. FAS Techs., Inc.*, 138 F.3d 1448, 1456, 46 USPQ2d 1169, 1174 (Fed. Cir. 1998) (*en banc*). The standard of review for jury instructions is prejudicial legal error. See *Jamesbury Corp. v. Litton Indus. Prods.*, 756 F.2d 1556, 1558, 225 USPQ 253, 255 (Fed. Cir. 1985), *overruled on other grounds by A.C. Aukerman Co. v. R.L. Chaides Constr. Co.*, 960 F.2d 1020, 22 USPQ2d 1321 (Fed. Cir. 1992) (*en banc*). To prevail, the party challenging the jury instruction "must demonstrate both that the jury instructions actually given were fatally flawed and that the requested instruction was proper and could have corrected the flaw." *Biodex Corp. v. Loredan Biomedical, Inc.*, 946 F.2d 850, 862, 20 USPQ2d 1252, 1261 (Fed. Cir. 1991). "An erroneous instruction regarding claim interpretation that affects the jury's decision on infringement is grounds for a new trial." *Ecolab Inc. v. Paraclipse, Inc.*, 285 F.3d 1362, 1373, 62 USPQ2d 1349, 1356 (Fed. Cir. 2002).

Telegenix, which timely objected to the jury instructions at trial, argues that the district court erroneously interpreted the claims of the asserted patents in its *Markman* order and instructed the jury according to the erroneous claim constructions. Telegenix further argues that the district court abused its discretion in excluding certain evidence offered by Telegenix and in admitting other evidence presented by Texas Digital, and erroneously relied on the rule of *Wine Railway Appliance Co. v. Enterprise Railway Equipment Co.*, 297 U.S. 387 (1936). On these grounds, Telegenix seeks a new trial. We address each of the allegations of error in turn.

I. The Contours of Claim Construction

"In construing claims, the analytical focus must begin and remain centered on the language of the claims themselves, for it is that language that the patentee chose to use to 'particularly point[] out and distinctly claim[] the subject matter which the patentee regards as his invention.' 35 U.S.C. §112, ¶ 2." *Interactive Gift Express, Inc. v. Compuserve, Inc.*, 256 F.3d 1323, 1331, 59 USPQ2d 1401, 1406 (Fed. Cir. 2001). The terms used in the claims bear a "heavy presumption" that they mean what they say and have the ordinary meaning that would be attributed to those words by persons skilled in the relevant art. *See CCS Fitness, Inc. v. Brunswick Corp.*, 288 F.3d 1359, 1366, 62 USPQ2d 1658, 1662 (Fed. Cir. 2002); K-2

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Corp. v. Salomon S.A., 191 F.3d 1356, 1362-63, 52 USPQ2d 1001, 1004 (Fed. Cir. 1999); *Johnson Worldwide Assocs., Inc. v. Zebco Corp.*, 175 F.3d 985, 989, 50 USPQ2d 1607, 1610 (Fed. Cir. 1999); *Specialty Composites v. Cabot Corp.*, 845 F.2d 981, 986, 6 USPQ2d 1601, 1604 (Fed. Cir. 1988).

Moreover, unless compelled otherwise, a court will give a claim term the full range of its ordinary meaning as understood by persons skilled in the relevant art. *See Rexnord Corp. v. Laitram Corp.*, 274 F.3d 1336, 1342, 60 USPQ2d 1851, 1854 (Fed. Cir. 2001); *Johnson Worldwide Assocs.*, 175 F.3d at 989, 50 USPQ2d at 1610; *Specialty Composites*, 845 F.2d at 986, 6 USPQ2d at 1604.

It has been long recognized in our precedent and in the precedent of our predecessor court, the Court of Customs and Patent Appeals, that dictionaries, encyclopedias and treatises are particularly useful resources to assist the court in determining the ordinary and customary meanings of claim terms. *See Teleflex, Inc. v. Ficosa N. Am. Corp.*, 299 F.3d 1313, 1325, 63 USPQ2d 1374, 1380 (Fed. Cir. 2002) ("The ordinary meaning of a claim term may be determined by reviewing a variety of sources, including ... dictionaries and treatises ..." (internal citations omitted)); *CCS Fitness*, 288 F.3d at 1366, 62 USPQ2d at 1662 ("[O]ur precedents show that dictionary definitions may establish a claim term's ordinary meaning."); *Optical Disk Corp. v. Del Mar Avionics*, 208 F.3d 1324, 1334-35, 54 USPQ2d 1289, 1295 (Fed. Cir. 2000) ("For such ordinary meaning, we turn to the dictionary definition of the term."); *Quantum Corp. v. Rodime, PLC*, 65 F.3d 1577, 1581, 36 USPQ2d 1162, 1166 (Fed. Cir. 1995) ("[W]e see no error in the district court's use of dictionary definitions to ascertain the ordinary meaning of the relevant claim limitation."); *In re Ripper*, 171 F.2d 297, 299, 80 USPQ 96, 98 (C.C.P.A. 1948) ("[I]t is clear that in ascertaining the meaning of [the claim term] as it appears herein, reference properly may be made to the ordinary dictionaries.").

Dictionaries are always available to the court to aid in the task of determining meanings that would have been attributed by those of skill in the relevant art to any disputed terms used by the inventor in the claims. *See Vitronics Corp. v. Conceptronic, Inc.*, 90 F.3d 1576, 1584 n.6, 39 USPQ2d 1573, 1578 n.6 (Fed. Cir. 1996) ("[T]echnical treatises and dictionaries ... are worthy of special note. Judges are free to consult such resources at any time ...and may also rely on dictionary definitions when construing claim terms . . ."); *Cybor Corp.*, 138 F.3d at 1459, 46 USPQ2d at 1177 (citing *Vitronics* for the proposition that a court is free to consult dictionaries, encyclopedias, and treatises at any time to help determine the meaning of claim terms); *Vanguard Prods. Corp. v. Parker Hannifin Corp.*, 234 F.3d 1370, 1372, 57 USPQ2d 1087, 1089 (Fed. Cir. 2000) ("A dictionary is not prohibited extrinsic evidence, and is an available resource of claim construction.").

[1] When a patent is granted, prosecution is concluded, the intrinsic record is fixed, and the public is placed on notice of its allowed claims. Dictionaries, encyclopedias and treatises, publicly available at the time the patent is issued, are objective resources that serve as reliable sources of information on the established meanings that would have been attributed to the terms of the claims by those of skill in the art. Such references are unbiased reflections of common understanding not influenced by expert testimony or events subsequent to the fixing of the intrinsic record by the grant of the patent, not colored by the motives of the parties, and not inspired by litigation. Indeed, these materials may be the most meaningful sources of information to aid judges in better understanding both the technology and the terminology used by those

skilled in the art to describe the technology.

These materials serve as important resources to assist courts in many ways. For example, they are often used to aid in the interpretation of statutes and regulations and in the interpretation of terms used in contracts. *See, e.g., Rocknel Fastener, Inc. v. United States*, 267 F.3d 1354, 1356-57 (Fed. Cir. 2001) (advising that the interpretation of tariff terms, a matter of statutory construction, may be aided by reviewing “dictionaries, scientific authorities, and other reliable information sources” (citations omitted)); *Am. Express Co. v. United States*, 262 F.3d 1376, 1381 n.5 (Fed. Cir. 2001) (in interpreting Internal Revenue Service regulations and procedures, “[i]t is appropriate to consult dictionaries to discern the ordinary meaning of a term not explicitly defined by statute or regulation”); *Bowers v. Baystate Techs.*, No. 01-1108, 2002 U.S. App.

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LEXIS 17184, at *14-15 [64 USPQ2d 1065] (Fed. Cir. Aug. 20, 2002) (construing contract terms using non-technical and technical dictionaries); *Buchanan v. Dep’t of Energy*, 247 F.3d 1333, 1339 (Fed. Cir. 2001)-(relying on a dictionary definition in construing a settlement agreement). These materials deserve no less fealty in the context of claim construction.

As resources and references to inform and aid courts and judges in the understanding of technology and terminology, it is entirely proper for both trial and appellate judges to consult these materials at any stage of a litigation, regardless of whether they have been offered by a party in evidence or not. Thus, categorizing them as “extrinsic evidence” or even a “special form of extrinsic evidence” is misplaced and does not inform the analysis.

Because words often have multiple dictionary definitions, some having no relation to the claimed invention, the intrinsic record must always be consulted to identify which of the different possible dictionary meanings of the claim terms in issue is most consistent with the use of the words by the inventor. *See Dow Chem. Co. v. Sumitomo Chem. Co.*, 257 F.3d 1364, 1372-73, 59 USPQ2d 1609, 1614 (Fed. Cir. 2001); *Multiform Desiccants, Inc. v. Medzam, Ltd.*, 133 F.3d 1473, 1478, 45 USPQ2d 1429, 1433 (Fed. Cir. 1998). If more than one dictionary definition is consistent with the use of the words in the intrinsic record, the claim terms may be construed to encompass all such consistent meanings. *Rexnord*, 274 F.3d at 1343, 60 USPQ2d at 1858 (holding that the claim term “portion” may be interpreted in accordance with the dictionary definitions to encompass both “separate” and “integral” parts of an object). The objective and contemporaneous record provided by the intrinsic evidence is the most reliable guide to help the court determine which of the possible meanings of the terms in question was intended by the inventor to particularly point out and distinctly claim the invention. *See Renishaw PLC v. Marposs Societa’ per Azioni*, 158 F.3d 1243, 1250, 48 USPQ2d 1117, 1122 (Fed. Cir. 1998) (“The construction that stays true to the claim language and most naturally aligns with the patent’s description of the invention will be, in the end, the correct construction.”).

Moreover, the intrinsic record also must be examined in every case to determine whether the presumption of ordinary and customary meaning is rebutted. *See id.* Indeed, the intrinsic record may show that the specification uses the words in a manner clearly inconsistent with the ordinary meaning reflected, for example, in a dictionary definition. In such a case, the inconsistent dictionary definition must be rejected. *See id.* (“[A] common meaning, such as one expressed in a relevant dictionary, that flies in the face of the patent disclosure is undeserving of fealty.”); *Liebscher v. Boothroyd*, 258 F.2d 948, 951, 119 USPQ 133, 135 (C.C.P.A. 1958) (“Indiscriminate reliance on definitions found in dictionaries can often produce absurd results.”). In short, the presumption in favor of a dictionary definition will be overcome where the patentee, acting as his or her own lexicographer, has clearly set forth an explicit definition of the term different from its ordinary meaning. *See In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994); *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387-88, 21 USPQ2d 1383, 1386 (Fed. Cir. 1992). Further, the presumption also will be rebutted if the inventor has disavowed or disclaimed scope of coverage, by using words or expressions of manifest exclusion or restriction, representing a clear disavowal of claim scope. *See Teleflex*, 299 F.3d at 1324, 63 USPQ2d at 1380.

[2] Consulting the written description and prosecution history as a threshold step in the claim construction process, before any effort is made to discern the ordinary and customary meanings attributed to the words themselves, invites a violation of our precedent counseling against importing limitations into the claims. *See, e.g., Generation II Orthotics Inc. v. Medical Technology Inc.*, 263 F.3d 1356, 1367, 59 USPQ2d 1919, 1928 (Fed. Cir. 2001) (“The district court should have construed the claim limitation ‘controlled’ according to its ordinary and accustomed meaning [citing medical dictionary], rather than importing a characteristic of a disclosed or preferred embodiment into that term.”); *Loctite Corp. v. Ultraseal Ltd.*, 781 F.2d 861, 867, 228 USPQ 90, 93 (Fed. Cir. 1985) (“Generally, particular limitations or embodiments appearing in the specification will not be read into the claims.”), *overruled on other grounds by Nobelpharma*

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AB v. Implant Innovations, Inc., 141 F.3d 1059, 46 USPQ2d 1097 (Fed. Cir. 1998). For example, if an invention is disclosed in the written description in only one exemplary form or in only one embodiment, the risk of starting with the intrinsic record is that the single form or embodiment so disclosed will be read to require that the claim terms be limited to that single form or embodiment. *See Teleflex*, 299 F.3d at 1328, 63 USPQ2d at 1383 (“To the extent that the district court construed the term ‘clip’ to be limited to the embodiment described in the specification, rather than relying on the language of the claims, we conclude that the district court construed the claim term ‘clip (28)’ too narrowly.”); *Comark Communications, Inc. v. Harris Corp.*, 156 F.3d 1182, 1186, 48 USPQ2d 1001, 1005 (Fed. Cir. 1998) (cautioning against the limitation of the claimed invention to preferred or specific embodiments or examples); *Transmatic, Inc. v. Gulton Indus., Inc.*, 53 F.3d 1270, 1277, 35 USPQ2d 1035, 1040-41 (Fed. Cir. 1995) (“[A] patent claim is not necessarily limited to a preferred embodiment disclosed in the patent.”); *SRI Int'l, Inc. v. Matsushita Elec. Corp.*, 775 F.2d 1107, 1121 n.14, 227 USPQ 577, 585 n.14 (Fed. Cir. 1985) (*en banc*) (“That a specification describes only one embodiment does not require that each claim be limited to that one embodiment.”). Indeed, one can easily be misled to believe that this is precisely what our precedent requires when it informs that disputed claim terms should be construed in light of the intrinsic record. *See, e.g., Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1329-30 (Fed. Cir. 1995) (stating the claims must be construed in light of the specification and the patent’s prosecution history, if in evidence). But if the meaning of the words themselves would not have been understood to persons of skill in the art to be limited only to the examples or embodiments described in the specification, reading the words in such a confined way would mandate the wrong result and would violate our proscription of not reading limitations from the specification into the claims. *See, e.g., Teleflex*, 299 F.3d at 1328, 63 USPQ2d at 1383; *Generation II Orthotics*, 263 F.3d at 1367, 59 USPQ2d at 1928; *Comark*, 156 F.3d at 1186, 48 USPQ2d at 1005; *Transmatic*, 53 F.3d at 1277, 35

USPQ2d at 1040-41; *SRI Int'l*, 775 F.2d at 1121 n.14, 227 USPQ at 585 n.14.

By examining relevant dictionaries, encyclopedias and treatises to ascertain possible meanings that would have been attributed to the words of the claims by those skilled in the art, and by further utilizing the intrinsic record to select from those possible meanings the one or ones most consistent with the use of the words by the inventor, the full breadth of the limitations intended by the inventor will be more accurately determined and the improper importation of unintended limitations from the written description into the claims will be more easily avoided.

A. "repeatedly substantially simultaneously activating"

Each of the asserted claims of TDS's '481 and '561 patents includes the limitation, "repeatedly substantially simultaneously activating." ¹ The district court construed this limitation as follows:

The term *repeatedly* means "repeating" in its ordinary sense, and that the repetitions be fast enough such that the composite color is actually perceived by the viewer. The term *substantially, simultaneously activating* means that during some portion of this period (defined as *repeatedly*), the two separate lights are on at the same time. *Tex. Digital Sys. Inc. v. Telegenix, Inc.*, No. 3:98-CV-1537-R, slip op. at 11 (N.D. Tex. Dec. 6, 2000).

Telegenix argues that the district court erred by requiring merely that the lights *be on* simultaneously, instead of requiring that the activation of each light begin at substantially the same time. According to Telegenix, the district court improperly separated the adverbs "substantially simultaneously" from the verb it modifies, "activating," and thereby failed to require that the light emitting diodes ("LEDs") must be activated, or turned on, at the same time.

According to TDS, the crucial word in the phrase is "repeatedly," which would signal to one of skill in the art that the invention activates light sources repeatedly within the "refreshing

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period" or "repetition period" within which humans do not detect pulses due to the principle of "persistence of vision." TDS argues that because one of skill in the art would understand that the claim refers to simultaneously activating light sources of different colors at some time during that critical repetition/refreshing period, and because humans cannot detect changes, pulses, or activations that occur within that period, the question of whether one begins activation of the LEDs at the exact same time or whether one simply ensures that both of the LEDs are on at some time during the repetition period is irrelevant. Thus, according to TDS, one of skill in the art would not interpret the claim term "repeatedly substantially simultaneously activating the light sources" to limit the starting point of the LED activations.

[3] The district court correctly construed the term "repeatedly." However, the district court's construction of the overall phrase "repeatedly substantially simultaneously activating" was in error and ignored the meaning of the term "activating." We begin by ascertaining the ordinary meaning to one skilled in the art. See *Specialty Composites*, 845 F.2d at 986, 6 USPQ2d at 1604. According to a relevant technical dictionary, to activate is "[t]o start an operation, usually by application of an appropriate enabling signal." *Modern Dictionary of Electronics* 20 (6th ed. 1984). We presume that the word used in a claim carries this ordinary meaning, but this presumption may be rebutted. See *CCS Fitness*, 288 F.3d at 1366, 62 USPQ2d at 1662. Here, the intrinsic evidence is entirely consistent with the dictionary definition, and there is nothing in the record to suggest that "activating" means other than what its dictionary definition would suggest, i.e., starting the operation or turning on. We conclude that the presumption has not been rebutted, and thus the ordinary meaning controls.

TDS has argued that “activating” can mean “being on.” Certainly, once activated, a lamp might accurately be described as “being on.” But the claim does not refer to the state of the lamps as being “substantially simultaneously activated.” The words used, which serve as the focus of the claim construction analysis, call for “substantially simultaneously activating” the lamps, and the ordinary meaning of that phrase requires that during some portion of the period defined as “repeatedly,” the two separate lights are turned on at the same or nearly the same time.

B. “selectively controlling the durations of the time intervals of activation”

Claims 1 and 3 of both the ‘481 and '561 patents include the limitation “selectively controlling the durations of time intervals of activation.” In its *Markman* ruling, the district court explicitly refused to provide a distinct definition for this limitation, deeming the phrase “sufficiently defined.”

Telegenix contended before the district court, and reiterates on appeal, that this limitation means “specifically controlling the length of time that individual pulses are activated to vary the amount of light emitted from a light source.” Telegenix argues that by his disclosure in the specification, the inventor limited the claims to varying color using pulse width modulation (“PWM”), a technique that varies the duration of individual pulses. Telegenix further contends that the inventor limited the asserted claims to PWM by statements and amendments during prosecution of the patents in suit.

TDS responds that the claims are not limited to the particular PWM technique suggested by Telegenix. TDS urges that the claim language uses the plural form of both “durations” and “time intervals” and thus is consistent with an interpretation in which color is controlled with “more than one pulse and includes multiple activations of the same LED within the repetition period.” In other words, TDS urges a claim construction that would cover devices which change perceived light intensity by varying either the width of the pulses or the number of pulses.

The words of the claim require “controlling the durations” of the “time intervals of activation.” The plain meaning of “controlling the durations” indicates that the claimed invention requires variation of the duration of individual time intervals, or controlling the width of pulses, during which the LEDs are activated, e.g., PWM. This plain meaning is consistent with the specification of the '481 and '561 patents. The structures shown in Figures 9 and 11 of the '481 patent and Figure 1 of the '561 patent depict circuitry for driving the LEDs using PWM. As shown in Figure 9 of the '481 patent, the circuitry includes at

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least one counter 71f for each color connected to a corresponding memory 76 containing data regarding the amount of primary color activation required to produce the desired color. '481 patent, col. 4, ll. 24-59. The counter and corresponding memory are connected to a “flip-flop” 73 which provides the appropriate output to generate the desired color. *Id.* According to the specification, the “output of the flip flop 73 will be at a high logic level for a period of time proportional to the data” loaded into the counter 71f from the memory 76. *Id.* at col. 4, ll. 51-52. Thus, the circuitry controls color by setting the output “at a high logic level for a period of time proportional” to the desired color data.

Moreover, the prosecution history is consistent with this interpretation of the claim language. During prosecution of the '481 patent, the inventor distinguished prior art on the basis of PWM. The Patent Office initially rejected all claims in the application as obvious in view of the Kaelin reference, which taught that “LED color display elements can be varied by applying variable timed pulses to the individual diodes.” The applicant responded by submitting new claims and arguing that the invention “control[s] the durations of the pulses that are applied to the primary color light sources in the selected display areas to control the portions of the primary color light signals, to thereby control the color of the exhibited display unit.”

[4] On the basis of our review of the ordinary meaning of the words themselves, we conclude that this

limitation requires control of pulse width. This is entirely consistent with the intrinsic record. Contrary to TDS's argument, introducing multiple pulses of identical duration during the repetition period does not effect control of pulse duration. Where multiple pulses of identical duration are introduced during a single repetition period, pulse duration remains constant and color is controlled not by varying "the durations of the time intervals of activation" of pulses, as called for in the claims themselves, but by varying the number of constant duration pulses applied. Such a technique does not set the output "at a high logic level for a period of time proportional" to the desired color data nor does it "control the durations of the pulses," and thus is inconsistent with the specification and prosecution history.

We conclude that "selectively controlling the durations of the time intervals of activation" means controlling the width of pulses during repetition periods.

C. "color control means"

The "color control means" limitation appears in claims 2, 4, and 7 of the '481 patent, and claims 2 and 4 of the '561 patent. The limitation appearing in claim 2 of the '481 patent is representative:

color control means for selectively controlling the durations of the pulses applied to the light sources in the selected display areas to control the portions of the primary color light signals emitted therefrom, to thereby control the color of the exhibited display unit. '481 patent, col. 9, ll. 59-64. The district court construed this limitation to be a means-plus-function limitation—a conclusion with which we agree. Neither party disputes that this limitation is subject to 35 U.S.C. §112, paragraph six. That paragraph states:

An element in a claim for a combination may be expressed as a means or step for performing a specified function without the recital of structure, material, or acts in support thereof, and such claim shall be construed to cover the corresponding structure, material, or acts described in the specification and equivalents thereof. 35 U.S.C. §112, para. 6 (2000).

"Because this limitation is expressed in 'means plus function' language and because it does not recite definite structure in support of its function, it is subject to the requirements of 35 U.S.C. §112, ¶ 6 (1994)." *B. Braun Med., Inc. v. Abbott Labs.*, 124 F.3d 1419, 1424, 43 USPQ2d 1896, 1899 (Fed. Cir. 1997). The first step in construing such a limitation is to identify the function of the means-plus-function limitation. *Micro Chem., Inc. v. Great Plains Chem. Co.*, 194 F.3d 1250, 1258, 52 USPQ2d 1258, 1263 (Fed. Cir. 1999). The next step is to identify the corresponding structure in the written description necessary to perform that function. *Id.* "Structure disclosed in the specification is 'corresponding' structure only if the specification or prosecution history clearly links or associates that structure to the function recited in the claim." *Braun*, 124 F.3d at 1424, 43 USPQ2d at 1900.

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The district court instructed the jury concerning the claimed function:

The color control means performs the function of selectively controlling the on times of the light sources to control the portions of primary color light signals for controlling the color of the composite light signal.

The district court described the corresponding structure from the specification as "the structure that performs as disclosed in the specification of the display decoder and decoder driver."

[5] Telegenix argues that the district court erred by misidentifying both the claimed function and the corresponding structure from the specification. We agree. The function recited in the asserted claims does not include "selectively controlling the on times of the light sources." Instead, the claim recites "selectively controlling the durations of the pulses applied to the light sources . . ." To the extent that the district court

failed to follow the claim language in defining the function, it erred. *See Micro Chem.*, 194 F.3d at 1258, 52 USPQ2d at 1263 (“The statute does not permit limitation of a means-plus-function claim by adopting a function different from that explicitly recited in the claim.”).

The district court further erred in its identification of “the display decoder and decoder driver” as the corresponding structure in the specification.

Section 112, ¶ 6, as is well-documented, was intended to permit use of means expressions without recitation of all the possible means that might be used in a claimed apparatus. ...The price that must be paid for use of that convenience is limitation of the claim to the means specified in the written description and equivalents thereof. *O.I. Corp. v. Tekmar Co.*, 115 F.3d 1576, 1583, 42 USPQ2d 1777, 1782 (Fed. Cir. 1997) (citations omitted). The duty to link or associate structure in the specification to the recited function is the quid pro quo for the convenience of employing § 112, paragraph 6. *Braun*, 124 F.3d at 1424, 43 USPQ2d at 1899. In the specification, the structure linked to the recited function of “selectively controlling the durations of the pulses applied to the light sources” includes the memory and counter circuitry illustrated in Figure 9. *See '481 patent*, col. 4, ll. 24-59. It was error for the district court to omit this structure from its claim construction of the color control means.

Accordingly, we conclude that the “color control means” performs the function of selectively controlling the durations of the pulses applied to the light sources to control the portions of the primary color light signals, to thereby control the color of the exhibited display unit. Moreover, we hold that the corresponding structure includes the memory 76, the counters 71e and 71f, the flip-flop 73, and associated connection circuitry illustrated in Figures 5 and 9. The color control means is limited to this corresponding structure and equivalents thereof.

D. “display areas” and “background area”

The patents in suit recite “display areas” and “background area” at several locations in the asserted claims. For example, claim 1 of the '619 patent recites “a plurality of variable color display areas ...; [and] a variable color background area” The district court instructed the jury:

Display areas and the *background areas* “include any illuminated pixel anywhere on the display device with background pixels illuminated to substantially surround the illuminated display area pixels.” As the image for illuminated display area changes, so does the adjacent illuminated *background area*.”

Telegenix argues that the jury should have been instructed that the display areas are distinct from the background areas, that display areas cannot become background areas, and that background areas cannot become display areas. TDS argues that the claims encompass display areas arranged in the form of an array or matrix of areas, and as such the display areas and background areas are interchangeable.

[6] Beginning with the words of the claims themselves, the dictionary meaning of display is “[a] visually observable presentation of information” *Illustrated Dictionary of Electronics* 147 (3rd ed. 1985). Background is defined as: “[the] context or supporting area of a picture” *Id.* at 43. Thus, the ordinary meaning of “display area,” as reflected in these dictionary definitions, is an area designated to portray information. Background is ordinarily understood to provide the context or contrasting reference against which the displayed

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information is presented. The ordinary meaning of these limitations does not indicate that the display and background areas are interchangeable.

The specification of the '619 patent is consistent with an interpretation in which the display and background areas are distinct and not interchangeable. For example, the written description describes the invention as including "a variable color display area" and "a variable color background area 32, substantially surrounding the display area." '619 patent, col. 2, ll. 16-21. The specifications of the patents in suit do not establish that display areas can *become* background areas, nor do they allow for their interchangeable use.

The specification of the '890 patent describes illuminating selected display areas in the background color to "blend with the background to provide maximum color contrast." '890 patent, col. 2, ll. 41-54. However, this establishes only that the inventor contemplated that display areas could *function* similar to the background areas, not that the display and background areas could be interchangeable.

Looking to the prosecution history, there is additional evidence supporting a construction that the display and background areas are mutually exclusive. The inventor stated in response to a rejection: "[claims 1 and 2], similar to claim 13 which was not explicitly rejected, are distinguished from the prior art by the recitation of background regions separated from the display areas by opaque walls. No reference of the record describes explicitly defined background regions." This evidence of manifest exclusion or restriction represents a clear disavowal of claim scope. *See Teleflex*, 199 F.3d at 1325, 63 USPQ2d at 1381. In doing so, the patentee expressly limited background areas to explicitly defined regions. In addition, the patent examiner stated in his notice of allowance, "[t]he prior art does not show the combination of variable color display areas *and* a variable color background area; these being two discrete, distinct components of the device. It is this distinction which, as claimed, is deemed allowable over the prior art."

The ordinary meaning of the words of the claims, coupled with the patentee's statements in the specification and during prosecution, establish that the district court's instruction was in error. Although the specification indicates that a display area can be illuminated in the background color to "blend with the background to provide maximum color contrast," there is no corresponding indication that the background areas can be illuminated in the display color. The district court's construction that background areas can include "any illuminated pixel anywhere on the display device" is incompatible with the patentee's statements during prosecution expressly limiting the background areas to "explicitly defined background regions."

Moreover, if the background and display areas could each include "any illuminated pixel," the background area would not be different in nature or quality from the display area. Such a proposition is inconsistent with the language of the claims, in which the inventor claimed a device having two types of areas, and with the specification which describes distinct display areas and background areas.

On the basis of the ordinary meaning of the words of the claim and the intrinsic evidence, we conclude that these limitations should be construed as follows: display areas include any illuminated pixel anywhere on the display device, other than background area pixels in defined background regions. The background area pixels substantially surround the illuminated display area pixels. Display area pixels may be illuminated in the background color, but background area pixels may not be illuminated in the display color.

E. "display areas arranged in a pattern"

The limitation "display areas arranged in a pattern" appears in the asserted claims of the '481 and '619 patents, as well as claim 4 of the '890 patent. The district court construed "pattern" to mean "having a systematic arrangement." Telegenix argues that this construction is too general, and the limitation should be limited to a seven-segment display pattern, for example, that shown in Figures 1ac of the '890 patent. TDS responds that this limitation is not limited to a seven-segment display or any other fixed pattern, and that the scope of the claims is broad enough to encompass a matrix display.

Where "pattern" is described in the specifications of the patents in suit, the seven-segment display is listed as an example of the preferred font. The '481 patent specification

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describes "seven elongated display segments a, b, c, d, e, f, g, arranged in a conventional pattern." '481 patent, col. 2, ll. 24-25. The preferred embodiment of the '890 patent is described as including "a variable color display area consisting of seven segments 31 arranged in a well known 7-segment font." '890 patent, col. 2, ll. 16-18. Nowhere in the specification is the limitation "display areas arranged in a pattern" restricted, explicitly or implicitly, to the seven-segment arrangement of the preferred embodiment.

Telegenix does not dispute that the patents in suit describe the seven-segment pattern in exemplary language. Instead, Telegenix argues that U.S. Patent No. 4,086,514 ("514 patent") establishes that the same inventor represented matrix displays and seven-segment displays as two separate embodiments of the same invention. We fail to understand the relevance of Telegenix's argument. Whether or not the claims in an unrelated patent are broad enough to encompass both a matrix and the familiar seven-segment pattern, this proposition sheds no light on whether the claims of the patents in suit are limited to the seven-segment pattern. *See Abbott Labs. v. Dey, L.P.*, 287 F.3d 1097, 1104, 62 USPQ2d 1545, 1550 (Fed. Cir. 2002) (finding the relationship between two unrelated patents, although having common subject matter, a common inventor, and the same assignee, "insufficient to render particular arguments made during prosecution of [one of the patents] equally applicable to the claims of [the other patent]").

Referring to the prosecution history, the Examiner's Statement of Reasons for Allowance for the '619 patent stated, "In this manner, multicolored arrays (i.e., color cathode ray tube displays such as Takeda, of record) in which there is no physical distinction between a foreground or background pixel (display area), are distinguished from by the claimed subject matter." Although the prosecution history may help define the scope of a term if relevant, *see Southwall Techs., Inc. v. Cardinal IG Co.*, 54 F.3d 1570, 1576, 34 USPQ2d 1673, 1676 (Fed. Cir. 1995), this Examiner's statement has no bearing on the meaning of the term "pattern." Nor does this statement limit the scope of "pattern" to the familiar seven-segment font.

Accordingly, because there is nothing in the claims or the intrinsic evidence of record to indicate otherwise, we conclude that this limitation was correctly construed by the district court according to the ordinary meaning of "pattern." The district court's construction, "having a systematic arrangement," is not in error.

F. "means for selectively activating said display light sources"

The limitation "means for selectively activating said display light sources" appears in claim 1 of the '619 patent. The district court instructed the jury:

The function of this means-plus function element is to control the activation of light sources to illuminate the display area in a first color and the background area in a second color, different from the display area's first color. The function is to activate the display area by passing current through selected light sources of the display area and the background area. The structural components are specified in Figures 3 and 4.

Telegenix argues that the court's construction is too broad, and misled the jury to believe that this limitation can be met by any structure broadly suggested by Figure 3, which shows only a block diagram. Telegenix requested an instruction limiting the structure to the circuitry shown in Figure 4. Telegenix also argues that "passing current through selected light sources" incorrectly identifies the function.

TDS argues that its expert testified that "means for selectively activating" includes hardware, software, and/or firmware for passing current through selected light sources, as supported by Figures 3 and 4. TDS argues that a block diagram such as that shown in Figure 3 may describe structure.

TDS argues in favor of a broad interpretation of this claim limitation in reliance on the testimony of its expert. “[E]xtrinsic evidence in general, and expert testimony in particular, may be used only to help the court come to the proper understanding of the claims; it may not be used to vary or contradict the claim language.” *Vitronics*, 90 F.3d at 1584, 39 USPQ2d at 1578. Where the patent documents are unambiguous, expert testimony regarding the meaning of a claim is entitled to no

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weight. *Id.* “Any other rule would be unfair to competitors who must be able to rely on the patent documents themselves, without consideration of expert opinion that then does not even exist, in ascertaining the scope of a patentee’s right to exclude.” *Id.* (quoting *Southwall Techs.*, 54 F.3d at 1578, 34 USPQ2d at 1678-79). Thus, where the patent documents are unambiguous, reliance upon the testimony of TDS’s expert witness would be improper.

We hold, and the parties do not dispute, that this limitation is in means-plus-function form and thus is subject to 35 U.S.C. §112, paragraph six. As stated above, in construing such a limitation, the task of the district court is first to identify the function recited for the limitation and next to identify the corresponding structure in the written description necessary to perform that function. *See Micro Chem.*, 194 F.3d at 1258, 52 USPQ2d at 1263.

The district court misidentified the recited function by including in the construction, “The function is to activate the display area by passing current through selected light sources of the display area and the background area.” This reference to “passing current” has no basis in the claim language. *See Generation II Orthotics*, 263 F.3d at 1364-65, 59 USPQ2d at 1926 (“When construing the functional statement in a means-plus-function limitation, we must take great care not to impermissibly limit the function by adopting a function different from that explicitly recited in the claim.”); *Micro Chem.*, 194 F.3d at 1258, 52 USPQ2d at 1263 (“The statute does not permit limitation of a means-plus-function claim by adopting a function different from that explicitly recited in the claim.”).

Likewise, the district court’s identification of the corresponding structure was incomplete. The description in the specification of the structure corresponding to the recited function is not limited to Figures 3 and 4, as instructed, but also includes the written description accompanying these Figures. *See '619 patent*, col. 3, ll. 34-68, and col. 4, ll. 1-61. Moreover, as Figure 3 and its accompanying text serve merely as overview for introducing and explaining Figure 4, the corresponding structures must necessarily be found in Figure 4.

We conclude that the “means for selectively activating” performs the function of “illuminat[ing] certain of said display areas in a first color, and said background light sources, to illuminate said background regions in a second color different from said first color.” The corresponding structure in the specification is described in Figure 4 and the accompanying written description, including the overview provided by Figure 3 and the written description accompanying that Figure. The “means for selectively activating” is limited to this corresponding structure and equivalents thereof.

G. “converter means”

The phrase “converter means” is a limitation recited in claim 4 of the '890 patent. The district court interpreted this phrase to mean:

The converter means includes firmware, software and/or hardware that functions to convert said display color control signals to obtain complementary color control signals.

Telegenix argues that this interpretation is unsupported, because no software or firmware is mentioned anywhere in the specification. Telegenix argues that the structure disclosed for the “converter means” is the multiplexer and inverter arrangement described in the written description and figures.

TDS argues that its expert testified that one of ordinary skill in the art would have appreciated that the converter means could be implemented in hardware, software, and/or firmware. TDS argues that the function of the converter means includes providing a complementary color in response to the selected display area color, and the multiplexer does not perform this function. Instead, according to TDS, only the inverter performs this function.

There is no dispute that “converter means” is a means-plus-function limitation within the meaning of section 112, paragraph 6. Again, in construing such a limitation, the task of the district court is to first identify the function recited for the limitation, and next to identify the corresponding structure in the written description necessary to perform that function. See *Micro Chem.*, 194 F.3d at 1258, 52 USPQ2d at 1263.

[7] In its construction of the “converter means,” the district court failed to identify the corresponding structure from the specification. The district court correctly performed the first step by identifying the claimed function, “to convert said display control color signals

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to obtain complementary color control signals.” However, the court’s description of the corresponding structure as “includ[ing] firmware, software and/or hardware” has no basis in the specification. TDS essentially admits in its brief that the testimony of TDS’s expert was used to broaden the court’s view of the corresponding structure beyond that disclosed in the specification and prosecution history. TDS argues that the structure identified by the district court could qualify as equivalent structure under section 112, paragraph six. This argument misunderstands the deficiency in the district court’s construction. Even if software and firmware could be equivalent structures under section 112, paragraph six, the court failed to correctly perform the second step of identifying the structure disclosed in the written description as corresponding to the recited function. Instead, the court identified a broad array of possible structures not mentioned anywhere in the specification.

We conclude that the district court erred in construing this limitation. Where the patent documents are unambiguous, expert testimony regarding the meaning of a claim is entitled to no weight. *Vitronics*, 90 F.3d at 1584, 39 USPQ2d at 1578. The “converter means” performs the function of converting the display color control signals to obtain complementary color control signals. The corresponding structure includes inverters 26a-c depicted in Fig. 3 and described in the specification at col. 3, ll. 31-39, and col. 4, ll. 8-27. The “converter means” is limited to this corresponding structure and equivalents thereof.

H. “first means” and “second means” for carrying color control signals

The “first means” and “second means” are limitations recited in claim 4 of the ‘890 patent. The district court instructed the jury:

The first means for carrying includes functions that are performed by electrical paths which are non-inverting buses for the red and green LEDs shown in Figure 3 and described in Column 3, lines 23-30. First means includes “firmware, software and/or hardware that function to carry the information which determines the display area (character) color.”

The court further instructed:

The second means for carrying includes functions that are performed by electrical paths which are inverting buses for the red and green LEDs shown in Figure 3 and described in column 3, lines 31-35. Second means for carrying includes “any firmware, software and/or hardware that function to carry complementary control signals.”

Telegenix repeats its arguments that the specification does not disclose "firmware, software, and/or hardware" that performs the claimed functions. Telegenix argues that the structure should be limited to inverting and non-inverting electrical buses.

TDS argues that Figure 2 shows structure for carrying the color control signals in the form of signal lines connecting the Display Color Control block 21 and the Complement Color Control block 22 with the Variable Color Display block 11.

Again, the parties do not dispute that the "first means" and "second means" are in means-plus-function form and thus are subject to 35 U.S.C. §112, paragraph six.

The district court misidentified both the recited function and the corresponding structure with respect to "first means" and "second means." Instead of identifying the function recited for the first means, the district court's instruction to the jury indicated that the function was "to carry the information which determines the display area (character) color." We disagree. This language appears nowhere in claim 4, and unnecessarily limits the function actually recited in claim 4, "carrying selective display color control signals." See *Generation II Orthotics*, 263 F.3d at 1364-65, 59 USPQ2d at 1926 ("When construing the functional statement in a means-plus-function limitation, we must take great care not to impermissibly limit the function by adopting a function different from that explicitly recited in the claim."). Likewise, the district court erred in identifying the recited function of the second means. The recited function is "for carrying said complementary color control signals."

Concerning the district court's identification of corresponding structure, it is undisputed that such structure includes the non-inverting buses described in the specification. However, the district court ventures beyond the specification to include in its construction "any firmware, software and/or hardware" that performs the identified function. Committing the same error as with the "converter means," the district court relied on expert testimony to

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broaden its interpretation of the corresponding structure beyond that appearing in the specification.

Although TDS argues that Figure 2 identifies structure broader than the inverting and non-inverting buses described in the written description, Figure 2 fails to describe any structure for the first and second means sufficient to comport with section 112, paragraph six. If a patentee fails to disclose an adequate corresponding structure in the specification, the patentee may fail to satisfy the bargain embodied in the statutory quid pro quo of section 112, paragraph six. See *Kemco Sales, Inc. v. Control Papers Co.*, 208 F.3d 1352, 1360, 54 USPQ2d 1308, 1313 (Fed. Cir. 2000). Notwithstanding its adequacy, Figure 2 provides no support whatsoever for the district court's identification of the corresponding structure as including "any firmware, software and/or hardware."

We conclude that the district court's claim construction for "first means" and "second means" was flawed to the extent that it misidentified the functions recited in claim 4 of the '890 patent and included in the corresponding structure "any firmware, software and/or hardware." See *Vitronics*, 90 F.3d at 1585, 39 USPQ2d at 1579 ("Because the specification clearly and unambiguously defined the disputed term in the claim, reliance on this extrinsic evidence was unnecessary and, hence, legally incorrect."). The recited function of the first means is "carrying selective display color control signals," and the corresponding structure includes "electrical paths which are non-inverting buses for the red and green LEDs shown in Figure 3 and described in Column 3, lines 23-30." The recited function of the second means is "carrying said complementary color control signals," and the corresponding structure includes "electrical paths which are inverting buses for the red and green LEDs shown in Figure 3 and described in column 3, lines 31-35." The first means and second means are limited to the identified corresponding structure and equivalents thereof.

I. "control means for selectively coupling said light sources"

The "control means for selectively coupling" appears in claim 4 of the '890 patent. Claim 4 of the '890 patent recites:

control means for selectively coupling said light sources in said display areas to said first means, for causing selective ones of said display areas to illuminate in a selected color defined by said display color control signals, and to said second means, for causing the remaining display areas to illuminate in a substantially complementary color defined by said complementary color control signals. '890 patent, col. 10, ll. 16-23.

The district court's instruction to the jury construing "control means" was:

Control means includes any firmware, software, and/or hardware that functions to selectively couple the light sources in the display areas to said first means for carrying thereby causing the selective ones of the display areas to illuminate in a selected color Control means is defined as a multiplexer. Multiplexers serve to selectively couple each display area of a display device to non-inverting and inverting buses in order to illuminate the display areas with either the desired color or a substantially complimentary color in accordance with the output of the decoder. The decoder output is respectively coupled to the display areas. The multiplexer simultaneously couples the display areas to the display control bus and couples the converted display signal to the background areas of the display device.

Telegenix argues that inclusion of "any firmware, software, and/or hardware" was error. Telegenix argues that the Statement of Reasons for Allowance in the prosecution history of the '890 patent shows that the inventor limited the claims to require a hardware multiplexer, thus firmware or software multiplexers would be excluded.

TDS concedes that the "control means" must include a multiplexer, but TDS contends that the circuit shown in Figure 4 of the '890 patent is not the only implementation of a multiplexer, again citing expert testimony in support.

The limitation "control means" is in means plus function form, and neither party disputes the district court's identification of the recited function, which we conclude is correct.

However, for the same reasons announced earlier with regard to the "converter means," the district court erred by including "any firmware, software, and/or hardware" in its

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identification of the corresponding structure. *See Vitronics*, 90 F.3d at 1585, 39 USPQ2d at 1579 ("Because the specification clearly and unambiguously defined the disputed term in the claim, reliance on this extrinsic evidence was unnecessary and, hence, legally incorrect."). We can find no support in the specification or prosecution history for such a broad array of structures. Instead, the specification describes a hardware multiplexer at col. 5, ll. 45-68 and col. 6, ll. 1-20, illustrated in Figures 3 and 4. We conclude that the correct construction of "control means" is that of the district court with the phrase "includes any firmware, software, and/or hardware that" excised from the first sentence and the phrase "a multiplexer" at the end of the second sentence replaced with the phrase — the multiplexer shown in Figure 4 and described in the accompanying written description, and equivalents thereof—.

II. Prejudicial Error

Telegenix has shown that the district court erred in construing limitations of the claims, but this alone is not enough to challenge jury instructions with respect thereto—the standard of review for jury instructions is prejudicial legal error. *See Jamesbury*, 756 F.2d at 1558, 225 USPQ at 255. Thus, to prevail, the party challenging a jury instruction “must demonstrate both that the jury instructions actually given were fatally flawed and that the requested instruction was proper and could have corrected the flaw.” *Biodex*, 946 F.2d at 862, 20 USPQ2d at 1261; *accord Ecolab*, 285 F.3d at 1372-73, 62 USPQ2d at 1356-1357.

[8] Although TDS argues that Telegenix has failed to demonstrate prejudice from these claim construction errors, Telegenix correctly points to the record, which shows that Telegenix warned the district court concerning the court’s failure to properly construe the means-plus-function limitations and proposed constructions of the disputed claim limitations that would have corrected the flaws.

On this record, we conclude that the claim construction errors committed by the district court were prejudicial. Accordingly, we vacate the decision of the district court and remand for a new trial of both liability and damages. To assist the district court on remand, we address the allegations of error regarding the admissibility of the challenged testimony of Brent W. Brown (“Brown”) and J. Carl Cooper (“Cooper”), and the district court’s reliance on the Supreme Court’s decision in *Wine Railway Appliance Co. v. Enterprise Railway Equipment Co.*, 297 U.S. 387 (1936).

III. Admissibility of Evidence

We review a trial court’s decision to exclude evidence for abuse of discretion. *Beech Aircraft Corp. v. Rainey*, 488 U.S. 153, 172 (1988). To be admissible, expert testimony must “assist the trier of fact to understand the evidence or to determine a fact in issue.” Fed. R. Evid. 702; *Kumho Tire Co. v. Carmichael*, 526 U.S. 137, 147 [50 USPQ2d 1177] (1999).

Telegenix argues that the district court abused its discretion by excluding the evidence offered by Brown, and by admitting the testimony of Cooper respecting damages. We first address Telegenix’s argument with respect to Brown and then with respect to Cooper.

A. Brown

Telegenix argues that the district court erroneously excluded the testimony of Brown, an engineer who developed a variable color LED display in the early 1980’s. Telegenix argues that Brown’s testimony, along with his 1982 patent application, would have shown that the patents in suit were in public use prior to one year before the original application in 1986.

The district court refused to admit Brown’s testimony, stating:

He testified that he had a prototype of a multicolor display unit somewhere prior to 1985. I think he testified ‘83 or so, somewhere around there, but he didn’t testify that it was out in the public anywhere or that any were sold prior to 1986. He just couldn’t remember. That’s the type of unreliable evidence that is difficult to make a determination whether or not to admit to a jury.

The district court also stated:

It’s too dangerous to submit this evidence to the jury based upon the testimony of Mr. Brown and their offer of proof because Mr. Brown is just uncertain of the facts and circumstances surrounding when the invention actually got out into the public. ... The Court finds that the uncorroborated testimony

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of Mr. Brown would be confusing to the jury . . .

[9] Telegenix argues that the district court erred by excluding Mr. Brown’s testimony as lacking in

sufficient corroboration. Telegenix contends that because his evidence was not offered as a party seeking to prove priority, no corroboration is required. Telegenix's argument misreads our caselaw on corroboration. "[C]orroboration is required of any witness whose testimony alone is asserted to invalidate a patent, regardless of his or her level of interest." *Finnigan Corp. v. Int'l Trade Comm'n*, 180 F.3d 1354, 1369, 51 USPQ2d 1001, 1012 (Fed. Cir. 1999). Thus, the district court correctly required corroboration for Brown's testimony.

Telegenix argues that, even if Brown's testimony required corroboration, his 1982 patent application and other documentary and physical evidence provided sufficient corroboration for his testimony. Telegenix argues that the court erred by excluding the 1982 unissued patent application as corroborating evidence, citing *Sandt Technology v. Rescoe*, 264 F.3d 1344, 1351, 60 USPQ2d 1091, 1094 (Fed. Cir. 2001).

We assess corroboration according to the factors enumerated in *Woodland Trust v. Flowertree Nursery, Inc.*:

(1) the relationship between the corroborating witness and the alleged prior user, (2) the time period between the event and trial, (3) the interest of the corroborating witness in the subject matter in suit, (4) contradiction or impeachment of the witness' testimony, (5) the extent and details of the corroborating testimony, (6) the witness' familiarity with the subject matter of the patented invention and the prior use, (7) probability that a prior use could occur considering the state of the art at the time, and (8) impact of the invention on the industry, and the commercial value of its practice. 148 F.3d 1368, 1371, 47 USPQ2d 1363, 1366 (Fed. Cir. 1998). "Documentary or physical evidence that is made contemporaneously with the inventive process provides the most reliable proof that the inventor's testimony has been corroborated." *Sandt*, 264 F.3d at 1350-51, 60 USPQ2d at 1094.

Despite Telegenix's argument, the district court did not refuse to consider Brown's 1982 unissued patent application, but instead expressly considered it for corroboration purposes. Judge Stickney stated in open court, "Now, Mr. Brown's testimony is not corroborated other than by his patent application, which the Court finds is insufficient corroboration."

However, the district court did refuse to consider Brown's '114 patent and physical evidence for corroboration purposes because it was not prior or contemporaneous evidence, as Telegenix concedes. TDS argues that the physical evidence offered with Brown's testimony was properly excluded because it was built after the effective date of the patents in suit. Whether or not the district court erred in refusing to consider this evidence for corroboration purposes, Telegenix faces a particularly high hurdle in attempting to demonstrate abuse of discretion in light of the stringent standard for corroboration. See *Juicy Whip, Inc. v. Orange Bang, Inc.*, 292 F.3d 728, 741-43, 63 USPQ2d 1251, 1260-61 (Fed. Cir. 2002). In the absence of further contemporaneous corroborating evidence, we are unable to conclude that the district court abused its discretion in refusing to admit Brown's testimony for lack of corroboration.

The district court excluded Brown's testimony for the further reason that Brown gave uncertain testimony concerning the date of public use: "Mr. Brown is just uncertain of the facts and circumstances surrounding when the invention actually got out into the public ... he just really doesn't remember anything." The district court cited Federal Rule of Evidence 403 ("FRE") and found that Brown's testimony would be confusing to the jury.

Although the record before us indicates that Brown gave clear and definite testimony concerning certain facts related to public use, it is also clear that Brown could not recall the details:

Q: You said you sold the company — did you sell multicolor displays using red and green LEDs prior to your sale of ISE to Bray in 1983?

A: I can't honestly remember at that point.

Q: Did Bray sell those devices after you sold the company to Bray and moved over to that company?

A: Yes. That was a product line that we continued to develop and was being sold

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when I bought the company back in 1986, in December.

Q: They were sold prior to 1986?

A: Yes.

Q: For approximately how long?

A: I can't tie it down exactly because the—it was an ongoing development, and I was running both companies, the whole division. So I can't tie it any closer than that.

The district court ultimately excluded the evidence because Brown could not establish a particular date of public use, a critical consideration for a statutory bar. The court found Brown's testimony unreliable and potentially confusing to the jury, and rightfully excluded it pursuant to FRE 403. On the basis of the record before us, we cannot conclude that the district court abused its discretion.

B. Cooper

Telegenix argues that the district court improperly admitted Cooper's revised expert report on patent damages. Telegenix contends that Cooper is unqualified to testify as an expert in this subject. Telegenix argues that Cooper's report contained numerous flaws, including that Cooper's profit calculations for Telegenix products were not based on the actual cost figures provided by Telegenix; that Cooper did not take into account that hypothetical licensing negotiations taking place in 1992 would have been with the inventor Mr. Havel, not with TDS; that Cooper did not account for revenues and profits from related products; and that Cooper's premise that TDS did not license its patents was false because the evidence showed that another company took two licenses.

[10] Despite Telegenix's qualifications argument, the evidence supports a finding that Cooper was competent and qualified. Cooper owned and managed two patent licensing companies following his work in manufacturing displays in the early 1990's.

The district court initially refused to admit Cooper's second damages report because Cooper had revised the cost figures provided by Telegenix. The court ruled that Cooper must use the actual cost figures provided by Telegenix, and permitted Cooper to submit another report with the corrected figures. Although Telegenix argues that it did not receive the revised report until shortly before trial, due to the nature of the revisions Telegenix can hardly claim unfair surprise.

Telegenix's other complaints allege no abuse of discretion by the district court. Instead, Telegenix takes issue with the content of Cooper's opinion. As the district court stated, Telegenix's complaints go to weight, not admissibility. We conclude that the district court did not abuse its discretion by admitting Cooper's corrected expert report.

IV. Wine Railway

Telegenix argues that the district court erroneously relied on *Wine Railway Appliance Co. v. Enterprise Railway Equipment Co.*, 297 U.S. 387 (1936), in sustaining the jury's award of damages for acts of infringement dating back to 1992. Telegenix argues that it did not receive notice that it was infringing the patents in suit until 1998, and, by permitting liability for acts prior to 1998, the rule of *Wine Railway* undermines the notice requirement of 35 U.S.C. § 287.

TDS argues that the damages awarded by the jury were not limited by section 287 because TDS did not trigger operation of the statute. TDS contends that it could not have triggered operation of the statute because it did not produce or sell the patented product—there was no “failure to mark” under 35 U.S.C. § 287(a). TDS argues that *Wine Railway* is still good law on which the district court properly relied.

[11] The Supreme Court in *Wine Railway* held that the patent marking statute then in effect did not require a patentee who did not produce the patented device to give actual notice to an infringer before damages could be recovered. Although *Wine Railway* interpreted a predecessor to the current patent marking statute, we have applied *Wine Railway* to the modern statutory counterpart, 35 U.S.C. §287. See *Nike, Inc. v. Wal-Mart Stores, Inc.*, 138 F.3d 1437, 1443, 46 USPQ2d 1001, 1008 (Fed. Cir. 1998); *Am. Med. Sys., Inc. v. Med. Eng'g Corp.*, 6 F.3d 1523, 1538, 28 USPQ2d 1321, 1332 (Fed. Cir. 1993); *Bandag, Inc. v. Gerrard Tire Co.*, 704 F.2d 1578, 1581, 217 USPQ 977, 979 (Fed. Cir. 1983). Telegenix's arguments reveal a misunderstanding of the patent marking statute. The statute does not specify when or under what circumstances damages may be recovered.

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Rather, it describes circumstances that effect a forfeiture of damages:

In the event of failure so to mark, no damages shall be recovered by the patentee in any action for infringement, except on proof that the infringer was notified of the infringement and continued to infringe thereafter, in which event damages may be recovered only for infringement occurring after such notice. 35 U.S.C. §287(a) (2000). Thus, section 287 "penalizes the use of unauthorized marks upon manufactured articles" and limits the extent to which damages may be recovered where products covered by a U.S. patent are sold without the notice defined in the statute. *Wine Railway*, 297 U.S. at 393. The recovery of damages is not limited where there is no failure to mark, i.e., where the proper patent notice appears on products or where there are no products to mark. *Id.* As the Supreme Court so aptly stated: The idea of a tangible article proclaiming its own character runs through this and related provisions. Two kinds of notice are specified—one to the public by a visible mark, another by actual advice to the infringer. The second becomes necessary only when the first has not been given; and the first can only be given in connection with some fabricated article. Penalty for failure implies opportunity to perform. *Id.* at 395. The district court did not err in its reliance on the rule of *Wine Railway*.

CONCLUSION

For the foregoing reasons, the decision of the district court is affirmed-in-part, reversed-in-part, and remanded.

AFFIRMED-IN-PART, REVERSED-IN-PART, and REMANDED

COSTS

No costs.

Footnotes

1Although certain claims of the patents in suit include a slight modification of this phrase, the parties have treated the modified phrases in an identical manner for purposes of this appeal.

- End of Case -

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